Thomas A. Edison Papers

A SELECTIVE MICROFILM EDITION

PART II
(1879–1886)

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START

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A Note on the Sources

The pages which have been filmed are the best copies available. Every technical effort possible has been made to ensure legibility.

THOMAS A. EDISON PAPERS

A SELECTIVE MICROFILM EDITION
PART II
(1879-1886)

REEL 62

DOCUMENT FILE SERIES (DOC-22)

D-82-034 through D-82-039
("Electric Light - Edison Machine Works - Accounts" through
"Electric Light - Foreign - United Kingdom - General")

1882. Electric Light - Edison Machine Works - Accounts (D-82-034)

This folder contains correspondence, monthly balance sheets, and other documents relating to the finances of the Edison Machine Works. All of the correspondence is by Charles Rocap, secretary of the machine works.

Approximately 30 percent of the documents have been filmed. The following categories of documents have not been filmed: routine financial correspondence; weekly financial statements; accounts relating to the electric railroad.

Sat. May 13/82

Mr Edison,

Mr Insull has said to me that you objected to signing a check in blank. I shall avoid in future the necessity for it –

The funds we shall require on a/c of foreign orders from this date will be needed about as follows –

For June a/c 4 Co's for
PoB – 10000 –
" July 4 Co's – PoB 15000 –
" " 6 Co's London 10000 –
" Aug 4 Co's PoB 5000 – or bal. of the a/c price not being yet set
" " 6 Co's London 15000.
" Sept 6 Co's " 20000. or bal. of the a/c price not being yet set.

It is very important that arrangements for these funds should be made now with PoB + London –

I hope the 250 light will take care of them selves. We drawing for them as we ship –

What are we to do next ~~two~~ week for funds? Unless you can make a payment done think we can get through.

Kocaf

EDISON MACHINE WORKS.
104 Goerck Street,

New York, May 27th 1882.

T. A. Edison, Esq.
Menlo Park,
N. J.

Dear Sir,

Enclosed please find Balance Sheet for Apr. Our Books are now found all right, and I shall send you regularly hereafter the statement on the 10th of each month. Please consider this first one the foundation or basis we start with, to compare those to follow.

Yours faithfully,
Charles Roesp

[ENCLOSURE]

EDISON MACHINE WORKS.

104 Goerck Street,

New York, May 27th 1882.

Balance Sheet, Apr. 30th 1882

Plant	$157,383.78	Capital	$164,111.03
Jobbing Stock	18,865.00	Profit & Loss	14,316.38
Labor & material	189,339.85	A/c Sales	178,382.71
A/cs. Receivable	19,299.74	A/cs Payable	28,078.25
	$384,888.37		$384,888.37

[ENCLOSURE]

EDISON MACHINE WORKS.
104 Goerck Street,

New York, May 27th 1882.

Number & class of dynamos built & sold to Apr. 30th 1882.

class	finished	sold	on hand
C.	3	3	–
J.	264	246	18
a.	3	3	–
E.	14	7	7

EDISON MACHINE WORKS.

104 Goerck Street,

New York, June 10th 1882.

Number & class of dynamos built & sold to May 31st 1882.
by Edison Machine Works

Class	finished to Apr 30	finished in May	sold to Apr. 30	sold in May		on hand May 31
C.	3	6	3	6	9	—
J.	264	28	246	20	266	26
K.	—	10	—	6	6	4
E.	14	10	7	7	14	10

EDISON MACHINE WORKS.

104 Goerck Street,

New York, June 15th 1882

Balance Sheet May 31. 1882

Plant	$ 161.202.71	Capital	$ 164.111.03
Isolated Stock	18.865.00	Profit and Loss	14.316.38
Labor & Material	238.524.25	a/c Sales	222.949.18
Cash a/c Recipts	27.845.94	April Balance Cash a/c Disbursements	1.216.60 24.158.66
a/c Receivable	33.549.75	a/c Payable	53.235.80
	$ 479.987.65		$ 479.987.65

EDISON MACHINE WORKS.
104 Goerck Street,

New York, June 20th 1882.

T. A. Edison, Esq.
Menlo Park, N. J.
Dear Sir,

It is my desire and wish that you should be constantly in possession of the fullest possible information as to the condition of these Works, and in order to make this easily done, I have so arranged my accounts that without any additional work, the balance at the end of each month shows at a glance exactly how we are running. I also give you a little balance of the dynamos each month. Now to summarize the information I give you once a month is as follows.

The ledger balance sheet showing your Plant - Capital
Securities - Profit
Stock - Sales
Cash Receipts - Cash Disbursements
Amt. owed us - Amt. we owe

The dynamo balance sheet gives you the total number of each kind of dynamos built since start to 1st month,
total number of each kind built during the month
" " " " sold to 1st of month
" " " " " during the month
balance " " on hand at end of month

I have thought that this would be not too much information but just enough to catch you in a spare moment, and still at the same time concisely cover every thing.

Yours faithfully,
Chas E Roe

EDISON MACHINE WORKS.
104 Goerck Street,

New York, July 19th 1882.

T. A. Edison, Esq.
Menlo Park, N. J.
Dear Sir,

I beg to hand you herewith balance sheet for month of June which also closes the first half of this year. Also please find accompanying the dynamo a/c. I think there is cause for congratulation on the showing made.

You will notice the Capital does not equal the Plant by over $5000. Our sales is about equal their offset, the labor & material a/c, then we have on hand at the time of this balance the following bare cost of work not paid for (not sold) about $25000. on Co $20000. on Jo. 3000 on L. 5000. Ko. 2500. freight Loco. total $51500. This of course will be turned out at some profit. Then we have $31000. in Isolated Stock. (I believe you say this is worth 200) and $14000. on profit and loss a/c last year, and 19 jd. on hand completed $10000. This makes $106500. Now we owe $42000. less owed us $16000. $26000. net. Deduct this from $106500. and it will leave $80500. profit.

Then we are building 50 Ko. = $67500. 15 Co = $150000. and 150 L = $135000. or $352500. worth of work on hand. Figuring on ~~[illegible]~~ the cost of similar work heretofore I think the 50 Ko will cost $50000. the 15 Co $127000. the 150 Lo. $100000. or total cost $277000. leaving about $75000. profit.

Yours very respy,
Chas. Rocafo

[ENCLOSURE]

EDISON MACHINE WORKS.

104 Goerck Street,

New York, July 19th 1882.

Balance Sheet, June 30th 1882

	Increase June	
Plant	8328.09	$ 169530.80
Isolated Stock a/c	12895.60	31740.60
Labor material	61375.88	298825.13
bal. May 31		2470.68
Cash a/c receipts June		92192.88
a/c Receivable	29.01 transfer	16081.41
bal. last mo.	33549.95	$ 610841.50
increase this	74914.21	
	108292.97	
receipts	92192.88	
	16100.09	
	18.68 transfer	
bal. this mo.		+ 16081.41

Capital		$ 164111.03
Profit Loss last year		14316.38
a/c Sales for June 74714.21		296588.39
Cash a/c disbursements on a/c a/cs Payable	80551.99	
" do. stock	12875.60	93427.59
a/c Payable		42398.11
bal. last mo.	$ 53235.80	$ 610841.50
increase this mo.	69932.98	
	122968.78	
Cash payments	80551.99	
	42416.79	
transfer	18.68	
bal. this mo		+ 42398.11

[ENCLOSURE]

EDISON MACHINE WORKS.
104 Goerck Street,

New York, July 19th 1882.

Number & class of dynamos built and sold to June 30th 1882

Class	finished to May 31	finished in June	Sold to May 31	Sold in June	on hand June 30
C.	9	—	9	—	—
K.	70	32	6	36	—
J.	292	5	266	12	19
E.	24	—	14	6	4

EDISON MACHINE WORKS.
104 Goerck Street,

New York, Aug 7 1882

T. A. Edison Esq
Menlo Park N. J.

Dear Sir

The product of the Shop for the week ending Aug 5th is as follows.

Ten (10) "K"'s
Twenty one (21) "S"'s
Seven (7) "E"'s

Shipped	"K"'s	"S"'s	"E"'s	"Jumbo"'s
to London		13.		
" Hamburg		2.		
" Antwerp		2.		
" Genoa		2.	7.	2.
" Lamp Co	1.			
" Isolated Co	3.	2.		
	4.	21.	7.	2

Respectfully submitted
Edison M. Works
Randolph

EDISON MACHINE WORKS.
104 Goerck Street,

New York, Aug. 12 1882

T. A. Edison, Esq.
Menlo Park,

Dear Sir,

The output of the shop this week has been 27 Ls. 14 Es. & 7 Ks. 1 jumbo, and we have shipped 26 Ls. 7 Es. & 6 Ks.

Yours faithfully,
Chas. Rocap

EDISON MACHINE WORKS.
104 Goerck Street,

New York, Aug 19th 1882.

T. A. Edison, Esq.
Menlo Park,

Dear Sir,

The output of the shop for this week is 13 Ds. 8 Ks. 6 Es. We have shipped abroad 1 "C." and 7 "Es." and to the Ds. Co. 4 Ks. and 5 Ls.

We have made and sold to date the following

Js.	made	326	sold	278	on hand		48
Ls.	"	77	"	67	"	"	10
Ks.	"	92	"	75	"	"	17
Cs.	"	15	"	13	"	"	2 ready for Engines
As.	"	3	"	3	"	"	none
Es.	"	54	"	44	"	"	10 x

x 7 to go to London
3 " " " Genoa

I have just received Mr Bliss's order for 10 Ks. 10 Ls. 10 Js. 1/2 to be Ad. and 1/2 Bs.

Col. Goddard paid up little a mon to day so have enough funds.

Yours truly,
Charles Clark

File

EDISON MACHINE WORKS.

104 Goerck Street,

New York, Aug. 22d 1882.

Balance Sheet, July 31st 1882

Plant	Increase July 7652.93	$ 177183.93	Capital		$ 164111.03
Ds. Stock a/c	Increase July 3294.40	35035.00	Profit Loss	Increase July 82.67	14399.05
Labor & Material	Increase July 93620.31	392445.44	Sales	Increase July 95987.42	392575.81
Cash a/c	balance July 1	1235.97	Cash a/c to a/cs Payable	70999.40	
	Receipts July	92124.93	" Ds. Stock	3294.40	74293.80
a/cs. Receivable		19979.36	a/cs Payable		72624.74
		$ 718004.43			$ 718004.43

Details

a/cs Rec. bal. June 30	$ 16081.41
Sales this month	95987.42
	112068.83
Less Cash Receipts	92124.93
	19943.90
transfer of a/c	35.46
Bal. this month	$ 19979.36

Details

a/cs Payable bal. June 30		$ 42395.11
Labor & Material this month	93620.31	
Plant	7652.93	101273.24
		143671.35
Ds. Stock		32944.40
		146965.75
Cash payments		74293.80
		$ 72671.95
transfer of a/c		47.21
Bal. this month		$ 72624.74

EDISON MACHINE WORKS,
104 Goerck Street,

New York, Aug. 26th 1882.

T. A. Edison, Esq.
Menlo Park,
N. J.

Dear Sir,

The output of the shop for this week is 20 Lo & 5 Ks. We have shipped 2 Bo. 10 Es. 3 Ks. & 2 Lo. This will make our dynamo a/c stand at this date as follows:

Bo. made	326	sold	280	on hand		46
Lo. "	97	"	69	"	"	28
Ks. "	97	"	78	"	"	19
Co. "	15	"	13	"	"	2
As. "	3	"	3	"	"	none
Es. "	54	"	54	"	"	"

Yours very truly,
Charles Rogers

EDISON MACHINE WORKS,
104 Goerck Street,

New York, ... 188

Balance Sheet, Aug. 31st 1882.

Plant	Increase Aug. 2974.57	$ 180 158.30	Capital	$ 164 111.03
Ds. Stock		35 035.00		
Labor Material	Inc. Aug. transfer 2700. 82929.52	478 426.41	Sales	Inc. Aug. transfer 2700. 119629.72 515256.98
Cash a/c bal. Aug 1		19 047.16	Cash a/c	73624.05
Receipts Aug.		99952.06	a/c Payable	38000.
a/c Receivable		34483.18	a/c Rec – T. A. Edison	111 624.05
Profit & Loss		23 600.95	a/c Payable	79 730.94
		$ 870723.00		$ 870723.00

a/c Rec. bal. July 31	$ 19979.36	a/c Payable bal. July 31	$ 72624.74
Sales this mo.	119629.72	Plant 2974.57	85904.09
Small transfer	.92	Labor & M. 82929.52	
	$ 139610.00		$ 158528.83
Less Cash Receipts	99952.06	Cash payments	73624.05
	$ 39657.94		$ 84904.78
Less transfers 586.74 4587.02	5174.76	transfer	5174.76
	$ 34483.18		$ 79730.02
		"	.92
			$ 79730.94

Profit & Loss a/c last mo. $ 14399.05

$ 38000. Cash T.A.E.

$ 23600.95 bal. this mo.

EDISON MACHINE WORKS.

104 Goerck Street.

New York, Sept. 6th 1882.

Product of the Shop, for week ending Sept. 2d 1882

CLASS.	No. on hand last week.	No. finished this week.	No. sold this week.	No. on hand this week.	Total No. made to date.
Z. 1 *	46	none	2	39	326
L.	28	6	none	34	103
K.	19	3	1	21	100
C. 2 *	2	none	none	2	15
A.	none	none	none	none	3
E.	none	none	none	none	54

1 * 46 were reported on hand last week; but by oversight in footing up the numbers sold, 5 of 6 sold 2nd July were left out, making the number on hand 5 more than we really had.

2 * Of the Co. we have, besides the 2 completely finished ready for engines, 3 very nearly done, 3 about 3/4 done and 3 just commenced.

Yours very truly,

Chas. E. Roesch

EDISON MACHINE WORKS.

104 Goerck Street,

New York, Sept. 18th 1882.

Product of the Shop, for week ending Sept. 16th 1882.

CLASS.	No. on hand last week.	No. finished this week.	No. sold this week.	No. on hand this week.	Total No. made to date.
J.	39	none	none	39	326
L.	34	25	none	59	128
K.	21	none	1	20	100
C.	2	1	none	3	16
a.	none	none	none	none	3
E.	none	none	none	none	54

File

EDISON MACHINE WORKS.

104 Goerck Street,

New York, Sept. 25th 1882.

Product of the Shop, for week ending Sept. 23rd 1882.

CLASS.	No. on hand last week.	No. finished this week.	No. sold this week.	No. on hand this week.	Total No. made to date.
J.	39	—	—	39	326
L.	59	4	3	60	132
K.	20	11	4	27	111
C.	3	3	—	6	19
E.	—	—	—	—	—
			1		1

File

EDISON MACHINE WORKS,
104 Goerck Street,

New York, ... 188

Balance Sheet Sep 30th 1882

Plant — Inc sep 762.64, Inc 4193.70	$185.114.64	Capital	164.111.03
Sid Stock — Increase 10.780	45.815.00		
Labor & Mat — Increase 56.609.39, trans 281.12, 56.890.51, 4193.70, 52.696.81	531.123.22	Sales — Increase sep 28895.32, trans 76.40	544.228.70
Cash a/c bal sep 1	7.395.11	Cash a/c — a/c Pay 31 431.45, Sd Stock 10.780	42 211.45
Rcpts Rep	35.804.70		
a/c Receivable	24.918.58	a/c Pay	103.134.47
Profit & Loss	23.514.40		
	853.685.65		853.685.65

a/c Rec Bal aug 31	34.483.18	a/c Pay bal aug 31	79.730.94
Sales Rep	28 895.32	Labor & Mat	56 609.39
	63.378.50	Plant	762.64
trans	2 655.22		137.102.97
	60.723.28		
Cash Rcpts	35.804.70	Cash	31 431.45
	24.918.58		105.671.52
		trans	2 537.05
			103.134.47

Profit & Loss aug 31 23.600.95
trans Dep 86.55
23.514.40

EDISON MACHINE WORKS

104 Goerck Street.

New York, Oct. 2d 1882.

Product of the Shop, for week ending Sept. 30th 1882.

CLASS.	No. on hand last week.	No. finished this week.	No. sold this week.	No. on hand this week.	Total No. made to date.
J.	39	—	6	33	326
L.	60	7	5	61	139
K.	27	7	8	26	118
C.	6	—	—	6	19
E.	—	—	—	—	54

EDISON MACHINE WORKS.

104 Goerck Street.

New York, Oct. 9th 1882.

Product of the Shop, for week ending Oct. 7th 1882.

CLASS.	No. on hand last week.	No. finished this week.	No. sold this week.	No. on hand this week.	Total No. made to date.
J.	33	7	6	34	333
L.	61	11	12	60	150
K.	26	7	1	32	125
C.	6	—	—	6	19
E.	—	—	—	—	54

RECEIVED
NOV 8 1882
ANSWERED

EDISON MACHINE WORKS.

104 Goerck Street.

New York, Nov. 7th 1882.

.....188...
FILE No. 12

Product of the Shop, for week ending 188

CLASS.	No. on hand ~~last week~~ Oct 7	~~No. finished this week~~	No. sold ~~this week~~ since	No. on hand ~~this week~~ Nov 7	Total No. made to date.
Z.	34		3	31	333
L.	60		5	55	150
K.	32		11	21	125
S.	6		1	5	19

Of the 5 Cs. finished, 2 are now being shipped, leaving 3 available. We have yet to deliver the London Co. 5. We also have 2 Cs. nearly done and 3 about 1/2 finished. We have yet to deliver the Ds. Co. 12 Ks. and 9 Ls. on their order, leaving us then to dispose of 9 Ks. 46 Ls. and 31 Js.

3. dynamos.

No. of Order		No. of Dynamos		Labor			Material			Total Cost		
				247.45			246.94			494.39		
3	1	20	all Completed	4	949	03	4	938	77	9	887	80
				204.05			262.90			466.96		
3	2	20	all Completed	4	081	12	5	258	19	9	339	31
				149.84			263.77			413.62		
3	3	50	all Completed	7	492	35	13	188	75	20	681	10
				112.42			268.95			381.38		
3	4	100	all Completed	11	242	64	26	895	78	38	138	42
				110.50			262.70			373.20		
3	5	100	done thus far	6	397	00	19	198	00	25	595	00
			Cost to finish	4	653	00	7	072	00	11	725	00
				110.50			262.70			373.20		
				109.96			262.36			372.36		
3	6	100	done thus far	2	097	00	16	087	00	18	184	00
			Cost to finish	8	899	00	10	149	00	19	048	00
				10	996		26	238		37	232	
				110.			262.			372.		
3	7	100	done thus far		641	00	4	593	00	5	234	00
			Cost to finish	10	359	00	21	607	00	31	966	00
				11	000		26	200		37	200	
				124.			263.			387.		
		490	Total Cost	60	811	14	128	987	49	189	798	63

1882. Electric Light - Edison Machine Works - Testing Department (D-82-035)

This folder contains correspondence, reports, and other documents relating to the testing of dynamos, meters, and other equipment. Much of the correspondence is by William S. Andrews, head of the testing department.

Approximately 50 percent of the documents have been filmed. A series of standard forms, used to report the voltage of various dynamos, have not been filmed.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Jan 2nd 1882

T. A. Edison Esq

Dear Sir,

I have not yet had an opportunity to try that exptl about position of brushes, as we have had no steam until today — I will have the dyn° put in position first thing to-morrow morning, and will then try it, and also try the new German Silver brushes just to hand.

I will let you know the results immediately

Yours respfly

W. S. Rudes

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Jan 11th 188 2

Thos. A. Edison Esq

Dear Sir —

I have experimented on the new G.S. Brushes, and find them to work better than any tried before — With a load of 200 Lamps at 16 C.P., using one pair of brushes, there is no spark at point of greatest E.M.F., and I can see but one serious fault with them — It seems to be impossible to keep each separate wire bearing on to commutator with equal pressure, so a few wires that make better contact than the rest, will begin to assume all the load, which immediately heats them red-hot — They then burn shorter, and the load is shifted on to some other few wires, and so it goes on, two or three or more wires being red-hot all the time, & the commutator

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, ... 188

I find that a heavy pressure cures this evil to a certain extent, but that soon uses up the brush and commutator by friction.

If the brushes could be ground on an emery wheel of the same size as commutator, so as to give them a fair show at starting, I think they would go well for some time.

Yours Wpfy
W. S. Andrews

W.E. Dodge, Jr., Pres.t

G.P. Cowles, Vice Pres.t & Treas.

A.A. Cowles, Sec'y.

Private Letter

Ansonia Brass & Copper Co.

No. 19 Cliff Street,

New York, Jan. 21st 1882

P.O. Box 2373.

Thomas A. Edison Esq.

65 Fifth Ave. City.

Dear Sir:

You will recollect our conversation last month about payments from Edison Machine Works and the Electric Tube Co. Both these concerns we are supplying with goods on existing contracts, at considerably below the regular ruling prices to-day. The terms agreed upon for settlements was 30 days, and you will observe from the statements herewith that October bills have not been paid fully by the Edison Machine Works, and that nothing has been paid for November or December account; also that the Electric Tube Co. owe us $9,418 all of which is due. We should like settlement of these accounts, or at least some definite understanding as to when they will be paid. We are unable to get any answer from the Edison Machine Works, although we have sent our Cashier repeatedly to try and ascertain what they are going to do. As to the Electric Tube Co., we are supplying them now at fully 15 per ct. less than present rates, and if we are to keep our part of the contract we must insist that payments be made as agreed upon in the ourset. If you will kindly give this your personal attention and inform me what arrangement can be made for settlement of the over-due accounts, I shall be very much obliged to you.

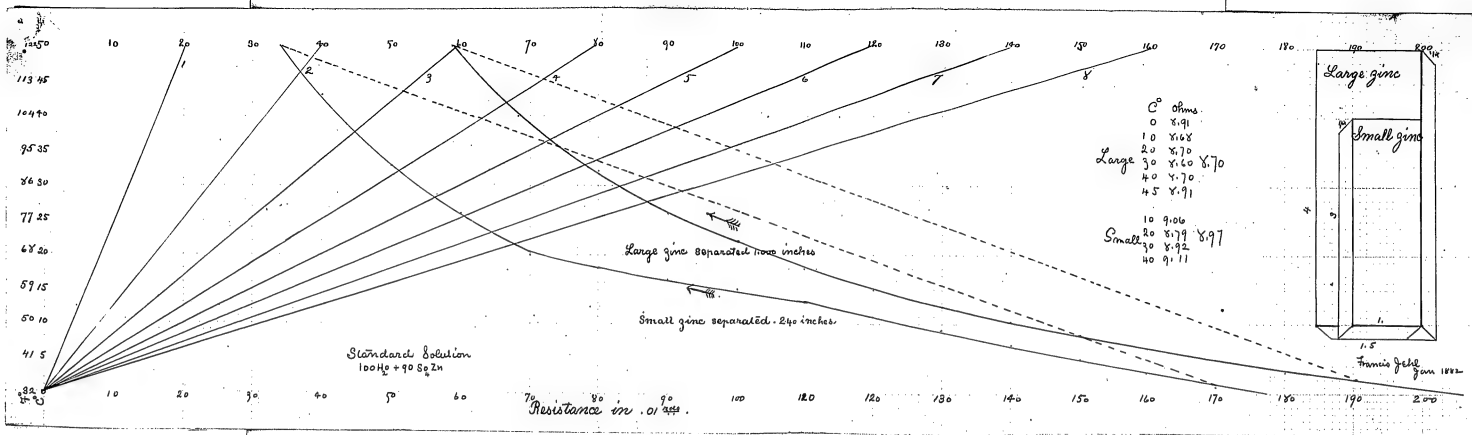
We have no desire to press you in any way, but you will see the justice of our position and the necessity of some better understanding. The writer would have called to see you, but is too busy to leave the office.

Awaiting the favor of your answer,

I remain,

Very truly yours,

Sec'y.


Large zinc separated two inches
Small zinc separated - 240 inches
Standard Solution
100 H_2O + 90 SO_4Zn
Resistance in .01 ohm.
C° ohms
0 8.91
10 8.68
20 8.70
30 8.60
40 8.70
45 8.91
Large 8.70
10 9.06
20 8.79
30 8.92
40 9.11
Small 8.97
Large zinc
Small zinc
Francis Jehl June 1882

TESTING DEPARTMENT.

EDISON MACHINE WORKS,

New York, Feb 16th 1882

"Z" Dynamo No. 164 (110 Volts.)

has been examined and tested by me, and found to be in good working order.

W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Mar 17th 1882

S. B. Eaton Esq
65 Fifth Ave City

Dear Sir

In compliance with your request of the 8th inst. I rendered Dr Moses such assistance as I was able to, in his arc light experiments. The rope, pulleys &c for suspending lamps cost me 80¢

Yours resp'ly
W. S. Andrews.

Testing Dept — Mar 21st/82

W. H. Meadowcroft Esq

Dear Sir

Thanks for 50 safe & sound on ap. of arc Light Caps —

Yours truly

W. J. Andrews

1882-04-14.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 1 188

~~Presidency Dept. Apl 14th/82~~

The following "J" Dynamos were tested this date at 55 Volt and Chrom, and found to be in good working order.

I have tested 3 Dynamos from to 110 Volt machines, & have tested more "A" armatures in separate Dynamos, and passed the same

M. S. Andrews

Shop No.	Foreign Plates
93	2
114	16
119	19
116	23
109	60
123	124
209	125
219	126
233	127
[illegible]	129

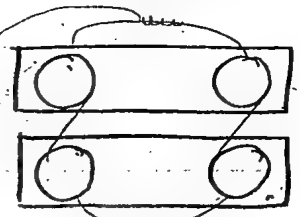
THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, May 9th 1882

Tested armature of 250 Light Dynamo - after small commutator had been put on It measured same as before

Roughly — .032 ohm

Insulation with Base - high with field connected thus:- it gave following results:—



Speed	1260
Load	250 "A" Lamps
Volts	109

commutator sparked badly

M. S. Andrews

9

THE EDISON ELECTRIC LIGHT CO.

May 9.82

Andrews

9

OFFICE OF

Edison Machine Works,

104 Goerck Street,

New York, May 13th 1882

T. A. Edison Esq.
Menlo Park N.J.

Dear Sir.

I enclose you herewith Mr Andrews data of last nights test.

Yours Respectfully.

E L Dean

[ENCLOSURE]

Test on 250 Light Dynamo — May 12th 1887

One pair of 8 in. cores and one pair 6 in do — each pair connected in series, and the two pairs multiple arced across line —

Load	300 "A" Lamps
Speed	1170
Volts on Line	87
Resistance in field	24 ohms

Load	300 "A" Lamps
Speed	936
Volts on Line	95
Resist in field	none

After running 30 minutes the bearings were ~~so~~ very hot, commutator & brushes also very hot — and the former considerably cut —

W. L. Andrews

[ENCLOSURE]

Test made on Bar Armature in a "3" Dynamo
cores multiple wound

Resist. of Magnet	9.5 ohms
Insulation "	very high
Resist of Armature	.0137 ohm
Speed	1200
Load	300 "A" Lamps
Volts on Line	54
Resist in field	2 ohms

After altering position of Brushes:-

Speed	1220
Load	300 A Lamps
Volts on Line	55.8
Resist in field	2 ohms

Speed	1230
Load	250 A Lamps
Volts on Line	59
Resist in field	none

Speed	1245
Load	200 "A" Lamps
Volts on Line	60.2
Resist in Line	none

[ENCLOSURE]

Speed	1245
Load	150 A Lamps
Volts on Line	605
Resist in field	none

Speed	1240
Load	100 A Lamps
Volts on Line	62
Resist in field	none —

Lamps suddenly went down, and the armature gave indications of broken connection — ~~Found copper strip broken away from end of one connector bar~~

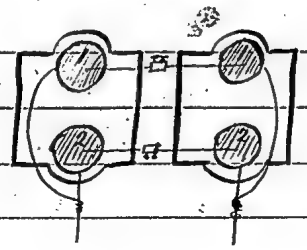
W. S. Andrews

The above test occupied about 2 Hours — We have not yet found out where the trouble lies —

.....188..
FILE NO. 49

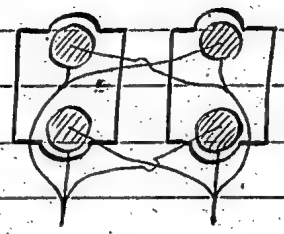
Test of Dynamo with two four inch Core magnets

Ordinary "A" armature used Resist = .143 ohm
Resist of Magnet No 1. 16.5 ohms
" " " No 2 17.4 "
Wiltz the two magnets multiple arced thus:- } resist = 8.5 "



No Load { Speed 1300
Volts at Dynamo 109
Consequent poles about 14 inches from tip of magnet

Wiltz all magnets multiple arced thus:-



No Load { Resist of magnets about 2 ohms
Speed 1330
Volts at Dynamo 128

The four in. cores became very hot

The Magnets in foregoing experiments were charged by another "a" Dynamo, which tested as follows:-

No Load { Speed 1300
Volts at Dynamo 150

May 27th 1882

W. S. Andrews
Testing Room

C

Dr L. A. Edison Esq
Dear Sir

By request of Mr Clark I send you notes of experiments we made with double ~~bar~~ magnets of four inch cores. Unfortunately the small bar armature has gone wrong, ~~partly~~ in some of the connections so we put in an ordinary "a" armature and made the tests. You will note that this armature measures high (.143 ohm) This is due to some new wire being used in it. Mr Dean knows about it, and it will not be used any more.

Yours respectfully,
W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, June 5th 1882

T. A. Edison Esq
Menlo Park —

Dear Sir —

We have had considerable trouble with the insulation of the 250 Light armatures due in large measure, if not entirely, to the acid which the men say they are obliged to use to make the hard solder flow when connecting up wires to commutator.

I do not think that a 110 Volt Dynamo, run for light should ever develope sufficient heat

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 188

to melt ordinary good soft solder, and by connecting with this, we could avoid the acid altogether and use rosin or paraffin for a flux — I think also that the resistance of armatures would be lowered by means of a more perfect joint. The hard solder will not run in amongst the wires, and I have reason to believe that some of the connections (made with hard solder) are too superficial — Kindly let us know your wishes in relation to this matter Yours respectfully

W. S. Andrews —

#365 Macon st - Brooklyn N.Y.
June 8th 1882

T. A. Edison Esq
Dear Sir

In plotting the curve it is desirable to have a little assistance from Mr Andrews - Will you please signify to him that he has liberty to give such assistance as far as his time will permit - I shall take some evening to do it -

Yours very truly
B. F. Card

P.S. Also sign enclosed pass so that Mr Dean may know that I am not intruding -

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, June 14 1882

T. A. Edison Esq.,

Dear Sir

The enclosed is a curve of resistance of zinc sulphate solution at different temperatures.

The blue line represents a solution prepared by dissolving 735 parts of zinc sulphate in 1000 of distilled water. It has a specific gravity of 1.290 at 15.5° C. and is the standard solution used for meters.

The red line is a solution prepared by dissolving 65 parts of the salt in 100 of water. It has a specific gravity of about 1.26. The special hydrometer sinks over an inch in this so

lution.

G. G. Grover June 14. 82

The black line is a solution 80–100 which has a specific gravity of about 1.31. The special hydrometer ~~sinks~~ rises about 9/16 inch in this solution.

It may be seen from this that the hydrometer will answer well for standardizing solutions

Yours &c

Geo. G. Grover.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, July 3rd 188

Send the disc Dynamo but not the Wallace Dynamo

T. A. Edison Esq
Menlo Park

Dear Sir

There is in the Testing Room here a Brush Dynamo belonging to you, and also a Disc Dynamo, which Notice has been ticketed - "Menlo"

Do you wish these machines to be sent to you? If so I will see them packed up and shipped -

Yours resp
W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, July 6 1882

T. A. Edison Esq.

Dear Sir

I have been trying some experiments with solutions of zinc sulphate of different densities to ascertain if there is any difference in the amount of zinc deposited or dissolved.

I used solutions from our standard S.G. 1.29 to standard diluted with an equal bulk of water S.G. 1.145. and in all cases the weight of zinc dissolved was very near the same (within 1 per cent) which shows the the density of the solution has no affect upon the weight of zinc dissolved.

In regard to the deposit there

appears to be a tendency to deposit more zinc, the more saturated the solution is.

In every experiment I have tried I obtained a larger deposit than the weight dissolved, but it is probable that with more dilute solutions the weight dissolved will equal that deposited.

If there is such a solution it will remain neutral, instead of becoming acid as all the solutions we have used have done. This would rid us of our chief bug, gas collecting on the plates.

I have tried some experiments with acid solutions. If I use a neutral solution I get a larger deposit than the amount dissolved

and of course the solution becomes acid. But when I use a solution containing 1 per cent. acid the amount dissolved is far in excess of the deposit, so that the solution becomes neutral.

There is probably a point where they neutralize each other and the solution will remain constant.

I have also tried an experiment in regard to temperature to ascertain if the quantity of zinc carried of is dependent upon temperature.

The amount dissolved is the same in a hot solution as in a cold one, the amount deposited is not

~~7~~ 9

July 6. 82

is not affected very much but
it may be to some extent.

Yours etc

Geo. G. Groves.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, July 18th 1882

T. A. Edison Esq
Menlo Park N.J.

Dear Sir
I enclose the test Invoice
on L Dynamo July 11/82
Resply Yours
W. S. Andrews

[ENCLOSURE]

Test of 150 Light Dynamo July 11/82

Armature resistance	.071 ohm
Magnet "	20.61 ohms
Insulation of Arm & Mag	very high
Speed	900 p/min
Load of Lamps by actual count	150 "a" lamps
Volts at Dynamo	106 —

Commenced night test at 8.30 P.M. —

8.30 P.M.	Speed	880
	Load	150 "a"
	E.M.F at Lamps	108 Volts
	" " Dynamo	110 "

9 P.M.	Speed	890
	Load	150
	E.M.F at Dynamo	115 Volts
	" " Lamps	113 "

over

[ENCLOSURE]

Brushes set well up on commutator.
Dynamo running well — — —
9.30 P.M

Speed	910
Load	150
E.M.F at Dy	112
" " Lamps	110.5

Brushes doing well & only a little warm probably due to too much pressure on Commu^tor. Armature & main wires a little warm — Journals very warm especially one on pulley end

10 P.M.	Speed	900
	Load	150 "a"
	E.M.F at Dy.	108 Volts
	" " Lamps	106.5 "

Brushes warm. Magnets & commutator warm. Journal on Pulley end quite hot
10.30 P.M.

Speed	900
Load	150
E.M.F at Dy.	110 Volts
" " Lamps	107 "

[ENCLOSURE]

Brushes & armature in good condition with regard to temperature, but cutting slightly

11. P.M.	Speed	900
	Load	148 a. lamps
	E.M.F at Dy	109 volts
	" " Lamps	106.5 "

Commutator and armature hot but not dangerously so

July 12/82 Ran for 2 Hours

	Speed	800
	Load	145 a. Lamps
	E.M.F at Dy	107 Volts
	" " Lamps	105 "

Everything cool & in good condition I observe a tendency to cut between brushes & commutator, but this is probably due to commutator being in rather bad condition at start

W. S. Andrews

Aug 1st 1882 —

Load 1200 Lamps
Speed 305
Volts at Dynamo 91.5
" " Lamps 84.6
No resistance in field —

Load 1200 Lamps
Speed 330
Volts at Dynamo 104
" " Lamps 95.4
No resistance in field —

Load 1200 Lamps
Speed 340
Volts at Dynamo 108
" " Lamps 98
No resistance in field

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Aug 2nd 1882

T. A. Edison Esq
Menlo Park —

Dear Sir
We ran the "O" Dynamo for about an hour last night, and found it work well — I enclose a copy of three readings that I took

Yours resp'ly
W. S. Andrews

I found it difficult to take the speed of engine accurately but the general results show that the dynamo is all right

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Aug 28th 1882

T. A. Edison Esq
Menlo Park N.J.

Dear Sir,

I enclose herewith a copy of test made on a 55 Volt K armature

Yours resp'ly
W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

/

St. Andrews,

New York, Sep 22nd 1882

T. A. Edison Esq
Menlo Park N.J.

Dear Sir:

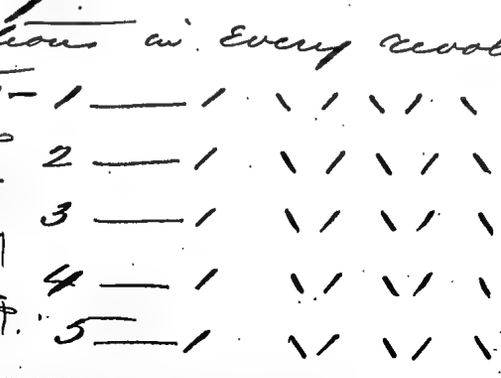
I have not yet taken connections of ring armature apart for they seem to be all right and I think that the alternating current may arise from the commutator bars being too wide.

The distance between any two poles of field magnet is only about 2 inches, and while the armature is passing this distance, and thereby reversing its

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, ... 188

polarity the ~~brushes~~ commutator has not moved far enough to present another bar to brushes, therefore the reversion occurs on one bar of commutator. I put 4 Bunsen cells on to field and turned the armature very slowly connecting poles to galvanometer — I obtained exactly six distinct deflections in every revolution thus:—



I repeated the experiment several times to be quite sure of results

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, ... 188

I cannot account for six changes for every revolution ~~on~~ in any other way than as suggested on first page, six being no multiple of eight — If you wish it I will re-connect the Armature, but feel sure it will act the same way when done, as the present connections have been carefully traced out — I think that the bars in commutator should be made much narrower, and have a wider insulation space

Yours respectfully
W S Andrews

28
80
84
124
360
840
1176

154
42
108
108
1120
29
6
1176

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Oct 11th 1882

Test made on New Dynamo
Magnets connected in series – four north
and four south – Total resistance = 24 ohms
Armature resistance = 8.5 ohms
Field excited with Shop current = 55 Volts

Load of "A" Lamps	Speed	Volts
30	545	25
20	550	34
10	585	47
2	630	122

Armature here developed cross with base

Load	20 a Lamps
Speed	690
Volts at End of cable	29
" between base + Brush	40

Lamps on line just visibly red – Lamp across base and either line about 20 C.P. but very flickering – Lamp being bright, though galvanometer indicates only 40 Volts shows

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, ... 188

an alternating current with an excess of E.M.F. in one direction.
Armature crossed with base Resist. to Polar
I think that the armature has been very poorly insulated, for it is constantly developing new crosses with base
Had it not better be rewound?

W. S. Andrews

Thos A. Edison Esq
65 Fifth Ave
City

W.E.Dodge, Jr., Pres.t

G.P. Cowles, Vice Pres.t & Treas.

A.A. Cowles, Sec'y.

Stenographic Letter

Ansonia Brass & Copper Co.

Nos. 81 & 83 Cliff Street,

P.O.BOX 2375

RECEIVED
OCT 28 1882
ANSWERED
20th Oct 1882
FILE NO. 17

New York Oct. 27th 1882

Thos. A. Edison Esq.

65 Fifth Ave, City.

Dear Sir:

We send you to-day, for testing, the following samples of copper wire, agreeable to your request;-

20½	lbs	No. 6	B. W. Gauge,	marked		'H'
18½	"	"	" "	"		'L'
32½	"	"00	" "	"		'L'
25½	"	"0	" "	"		'L'
97	"					

There is a slight difference in the manner of our manufacturing the sample marked 'H' and the three samples marked 'L'; if there is any difference in conductivity between the samples marked H and those marked L we should like to know it. We should be very glad to know the result of your test, and hope it will be satisfactory and that it will secure us the large order spoken of.

I remain,

Very truly yours.

A.A. Cowles, Sec'y.

Test of Safety Catches Nov 4th 1882

These safety catches are made of an alloy – 6 parts Lead, and 4 parts Tin – They are rolled to different thicknesses but cut to a uniform width of 1.25 inches. The distance between copper conductors = 1 inch

Thickness of Safety Catch	No. of lamps at which Catch blt out	Volts on Line	Remarks –
inch			
.02	300	100	Melted in centre thus
.03	430	"	" "
.04	550	"	" "
.05	655	"	" "
.06	775	"	" "
.07	900	"	" "
.08	1080	"	" "

With safety catches reduced in width to 0.96 inch — Other conditions remaining unaltered —

Thickness of S. Catch	No. of lps at which Catch burnt out	Volts on Line	Remarks
.01	130	100	
.01	130	"	Melted with 130 lamps in 30 secs —
.02	215	"	
.02	215	"	Melted with 215 lamps in 2 min.
.03	320	"	
.03	320	"	Melted with 320 lamps in ½ min
.04	415	"	
.04	415	"	Melted with 415 lamps in ¾ min
.05	500	"	
.05	500	"	Melted with 500 lamps in 1 minute
.06	580	"	
.06	580	"	
.07	675	"	
.07	675	"	
.08	775	"	
.08	780	"	
.09	—		
.09	—		

W. S. Andrews

If this machine could be run at 1100 or 1150 pr minute — we could use ordinary Co[illegible] brushes put up to point of least spark — And get 350 Lamps out of her Easily

WSA

Test of New K Armature — Resist^{ce} = .0210 ohm

Load of Lamps	Speed	Volts at Square	Volts at End of Cable	
				One G.S. Brush used on each side of Com^{tor}
350	1140	108	105	Brushes placed away up & on commutator
"	1120	105	101.5	" " a little lower down
"	1113	104	101	" " a little lower yet
"	1040	104	101	" " Lower
"	965	102	98.5	" " Lower
"	962	102	98	Brushes put down & within about 3/16 in of point of Greatest E.M.F. — Not sparking much, but very hot and smoking
"				

Brushes could not be put right away down to point of greatest E.M.F. on account of their getting so hot when in that position.

On concluding above test, after a run of about 1 Hour 30 Min. Forced brushes very hot — commutator quite hot but armature in good condition.

W. S. Andrews

Nov — 20

Andrews

1st Dynamo

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Nov 22nd 1882

T. A. Edison Esq
65 Fifth Ave City

Dear Sir,

The brushes used in this Expt were made of German Silver, Each were japanned separately up to point of Contact with Commutator. They were however only six inches long whereas the brushes used on C. Dy. that carried 250 Lamps were ten inches long. These 6in Ger. Sil. brushes did not warm up with 350 Lamps as long as they were put well up on Commutator to point of least Spark. They are therefore all right as far as carrying Capacity is Concerned — but when put down to point of greatest Effct, the sparking though not

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, ... 188

very bright, seems to be extremely intense and hot, for the brushes heat up immediately when put there. If the dynamo will bear running at a higer speed, it would seem to me to be more economical in all respects to do this, and use copper brushes in usual position seeing that no more power is consumed in running it thus at 1050 or 1100 than 900 or 950 with brushes down at point of greatest E.M.F. and the difference of wear on commutator is immense.

Yours respy

W. Andrews

over

I used only two German silver bushes in this expt — one on each side — Tow are now ready but I have been expected to see you down here, so have not yet tried them —

During the expt made on the 18th inst — the bushes were end on

N S A

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Nov 25th 1882

Saml Insull Esq
65 Fifth Ave City

Dear Sir

Please inform Mr Edison that I have tested the four samples of wire (copper) that were sent here by Ansonia B. M. Co — The conductivity you will find on another sheet herewith enclosed

Yours truly
W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Nov 25th 1882

Send to Cowles

Conductivity of four samples of copper wire from Ansonia B. & C. Co. —

No. 6. B.W.G. Pr. Centage of Conductivity = 99.5

No. 6. " " 99.5

No. 0. " " 98.1

No. 00. " " 98.6

W. S. Andrews

W.E. Dodge, Jr. Pres.t

C.P. Cowles, Vice Pres.t & Treas.

A.A. Cowles, Sec'y.

Stenographic Letter

P.O. Box 2315.

Arrowrock Brass & Copper Co.

Nos. 19 & 21 Cliff Street,

New York Nov. 29th 1882

Thos. A. Edison Esq.

65 Fifth Ave, City.

Dear Sir:

I have received your esteemed favor of Nov. 27th and note contents.

You recollect you kindly offered to give us a large order for wire in case our tests were higher than those of other parties of whom you had previously ordered. Will you kindly inform me if the tests contained in your favor of the 27th are satisfactory, and if they are high enough to secure the order?

I remain,
Very truly yours,

A. Cowles, Sec'y.

W.E. Dodge, Jr., Pres.t

G.P. Cowles, Vice-Pres.t & Treas.

A.A. Cowles, Sec'y.

Ansonia Brass & Copper Co.

No. 19 Cliff Street,

New York, Dec. 2nd 1882

P.O. Box 2373.

Mr T. A. Edison
65 – 5th Ave. City

Dear Sir

We have sent this day to your Mr Andrews – Testing Dep't. 104 Hoover St. one (1) coil of Insulated Wire (#18 Strbs) which we would like tested as you have heretofore had done for us – Will you please have it done soon as possible and return wire to us with report on same, charging us any expense you may be put to in doing same,

Yours
Very truly Yrs.
Ansonia Brass & Copper Co
Cowles –

Write Andrews to make test at once & report to T.A.E.

Write Ansonia that test shall be made & reported on at once

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Dec 2nd 1882

Connected Magnet of K Dynamo No 115 for quantity.
Resistance of Magnet = 2.96 ohms
Armature resistance = .03 "

Load of "a" Lamps =	250	250	250
Speed =	650	670	688
Volts at Dynamo =	90	92	94

Note — The boiler pressure was kept at about 120 lb. during this Experiment, but I could not get more than 688 Revolutions out of the engine, with the magnets of Dynamo coupled up in multiple arc —

W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Dec 4th 1882

Shall you have one
built for Edison by
the Edison Elec Light Co
at Fifth Ave City

Dear Sir,

I am pushing on the engs as fast as possible, but am much troubled to keep regular. Either by reason of the constantly varying steam pressure &c

I wish you would let me have an automatic regulator (of the "latest") It would assist me very much, and enable me to get more accurate results, as well as being a good test on the regulator

Yours Resp'ly
W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

Ans copy 15th
Dec 1882

New York, Dec 8th 1882

Thos. A. Edison Esq
65 Fifth Ave City

Dear Sir,

I have tested the sample of No 18 Rubber Covered wire for Insulation and find it to be 24½ million ohms per mile. — I soaked it in a bucket of acidulated water for 24 hours previous to testing it

The sample of wire of unknown composition, X compared with pure Copper has a per Centage of Conductivity = 10.5 nearly —

Yours truly
W. S. Andrews

X Sample (H)

Above samples from A B & C. Co —

THE EDISON ELECTRIC LIGHT CO.,
~~65 PARK AVENUE.~~
104 Gerard St New York, Dec 9th 1882

Report on Long German Silver Brushes with Mica Washers

Two of the above brushes were tried on a K dynamo, (Arm resis. = .03 ohm Copper Commr) with 340 "a" Lamps (at 100 volt) across line. Brushes were set down to point of greatest E.M.F. For a few minutes they worked well and carried off the heavy current with very little sparking. Several wires in each brush then became red-hot at point of contact with Commr and the brushes altogether very hot throughout

EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, ... 188

They then commenced to burn away, commutator at the same time becoming black & rough, so machine was stopped after a run of about ten minutes.

W. S. Andrews

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Dec 11th 1882

Test of 350 Light Dynamo —

Magnet Multiple arced Res. = 3.30 ohm
Armature res. = .021 ohm
German silver comm^r with 54 bars — Ordinary copper brushes set well up to point of least spark —

Load 350 "a" Lamps

Speed	Volts at Dy.	Volts at Lamps
850	100.7	97.8
885	103	100.5
886	104	100.5
928	109	106 —

After running 2½ Hours, comm^r end of arm. became very hot and commenced to smoke — When cold — it was tested with bridge and found all right as a

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Dec 13th 188 1

T. A. Edison Esq
65 Fifth Ave City

Dear Sir

I send you the result of our experiment with the long German silver brushes.

When they are fixed up I shall try them again with a lighter load on German Silver Commutator

I am getting on as fast as possible with the list of Expts you sent me to do — so far, I think, with good accurate results

Yours truly

W. S. Andrews

[ENCLOSURE]

Carrying Capacity of German Silver Wire —

Diam. of Wire	Length	Resist. of Wire at Temp. 60° F. ohms	No. of "A" Lamps	Volts at Lamps	Remarks —
.013"	6 feet	5.5	1	104	Just warm
"	"	"	2	"	Very Hot
.016"	"	3.78	2	"	quite warm
.021"	"	2.15	2	"	Warm
"	"	"	3	"	Very hot
.029"	"	1.2	3	"	Warm
"	"	"	4	"	Very hot
.032"	"	.95	5	"	Very hot (Wood begins to smell)
.037"	"	.71	5	"	Hot

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

W. S. Andrews.

New York, Dec 18th 1882

Thos. A. Edison Esq
65 Fifth Ave City

Dear Sir

I ran the 350 Light Dynamo today, that has had part of the field blocks cut away top and bottom.

After a two hours run with 350 "a" Lamps at from 100 to 104 Volts — I found the German Silver commutator to be very hot, but the armature comparatively cool. I think that the extra space between field blocks has a good cooling effect on the armature, and if you will compare the

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 188

following readings with those I sent to you on the 11th inst you may see that the power of Dynamo is not in any degree diminished by the cutting away of field —

Speed	890
Load	350 "a" Lamps
Volts at Dy.	102.5
" " Lamps —	100 —

The long phosphor bronze brushes do not work so well as the short german silver ones; but I think that this machine would go very nicely with copper commutator and ordinary copper R. Brushes

Yours Resp.
W. S. Andrews

[TEST REPORT BY WILLIAM S. ANDREWS]

Resistance of Wallace Carbons

Size	Actual Diameter	Length bet.n Copper Clamps in Inches	Length bet.n Copper Clamps in Dec. Foot	Resistance in Ohms	Resistance in Ohms per Foot	Area in Sq. Inches	Ohms per sq. Inch 1 Foot long.
1/8"	.128	7 3/4	.656	1.22	1.86	.0129	.0239
3/16"	.189	10 5/8	.896	.95	1.06	.028	.0296
1/4"	.248	10 5/8	.896	.47	0.53	.0483	.0256
5/16"	.305	9 13/16	.823	.30	0.36	.0726	.0261
3/8"	.371	9 1/2	.807	.178	0.22	.1075	.0236
7/16"	.455	8 7/8	.750	.137	0.18	.1618	.0291
1/2"	.501	9 1/4	.812	.103	0.126	.1963	.0247
9/16"	.567	9 1/2	.7917	.079	0.0997	.2606	.02598
5/8"	.621	9 1/2	.7917	.0755	0.0944	.3028	.02858
3/4"	.7405	9 1/2	.7917	.05	0.0632	.4307	.02722
7/8"	.871	9 1/2	.7917	.0375	0.0474	.5958	.02824
1"	.99	9 1/8	.7604	.0295	0.0388	.7698	.02986

"Dynamos."

Letter	Lamps	Floor Space	Height	Weight	Pulley Face	Pulley Diam'r	Revolutions Per Min.te	Horse Power	Price
E	15 a	25"x17½	2'11"	700lbs	3"	5"	2200	3	$500.-
"	30 B	do	[illegible]	do	do	do	do	do	530.-
Z	60 a	45"x39"	6'0"	3000"	6"	10"	1200	10	1200.-
"	120 B	do	do	do	do	do	do	do	1320.-
L	150 a	60"x39"	6'6"	[illegible]	9"	14"	900	19	2000.-
"	300 B	do	do	[illegible]	do	do	do	do	2300.-
K	250 a	70"x39"	do	8250"	9"	14"	900	35	3000.-
"	500 B	do	do	do	do	do	do	do	~~3500.-~~ 1350
R	500 a							70	
"	1000 B							do.	
C	1200 a	168"x105"		60300"				150	
"	2400 B	-	-	-				do	

Note:- "a" Lamp = 16, & "B" Lamp = 8 Candle Power

		Dimensions			
2	Oscillator	.069	magnets	20.00
		Machines		
		"	.0325	"	~~1.25~~ 3.80
~~[illegible]~~			~~[illegible]~~		~~[illegible]~~
6	"	"	"	.36	"	90.
6	(B)	"	"	.09	"	24.
4		"	"	.14	"	40.
8	(B)	"	.037	"	10.
1		"	.0048	"	2.25
					Freight
					Duty 4.00
					~~[illegible]~~ Foreign Lines
					3 inserted test
					+ brass approved
					Light overcoat
					directions notice

Resistance in Hundredths of an Ohm.
30 40 50 60 70 80 90 100 110 120 130 140
Temperature Degrees Centigrade.
0 10 20 30 40 50
Red = Solution 65 parts of zinc sulphate in 100 of water.
Blue = " 75 " " " " " 100 " " Standard.
Black = " 80 " " " " " 100 " "

9

Cum gisc. for
Mun bnis.

1882. Electric Light - Electric Tube Company (D-82-036)

This folder contains correspondence, agreements, and other documents relating to the business of the Electric Tube Company in New York City, which manufactured underground conductors for the Edison electric light system. Most of the correspondence is by John Kruesi, treasurer of the company.

Approximately 50 percent of the documents have been filmed. The following categories of documents have not been filmed: routine correspondence, such as letters relating to orders and to the shipment of goods; bills and receipts.

22

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

Esler

NEW YORK Jan 11 1882

Thomas A. Edison Esq.

Dear Sir

I called yesterday in relation to the Berthoud-Borel Underground Cables. The United States Underground Cable Company which Mr. Biederman undertook to organize, to manufacture these cables in this country, failed, owing partly to the absence of Biederman, to complete its organization within the legal limit prescribed and is therefore dead. The patents have been sold some, under an option, by Balzer & Lichtenstein, and I am about to organize a company to utilize them in this country. Adolf Hegewisch President of the U.S. Rolling Stock Company has consented to be president of the new company and most of the stockholders of the old company will renew their subscriptions. It is intended to have at least $150,000 in the treasury of the new company as a working fund exclusive of all monies paid for the patents. Inasmuch as each of the machines will run out 3 miles

of cable per day and will cost about $12,000 to make this seem an ample fund to meet all possible contingencies. It is desirable to make some arrangement for the manufacturing, the policy of the company not being to invest its funds in plant but rather to have its work made under contract with others. It is necessary however that the manufactured cable should be finished to the satisfaction of a practical and competent Electrician. With the object of providing such supervision and bearing in mind a remark of Mr. Biderman I called on you to learn, if an arrangement could be made by which you could undertake the Electrical Management of the Company, and have control of its manufacture. I expected to see you tonight but learn it is doubtful if you will be here. I must return to Philadelphia tonight but will be back Tuesday. Trusting that you will give this matter your attention and that you will accept

I remain yours very truly!

A letter to Phila will reach me Monday

Frederick B. Esler
49 Exchange Place N.Y.
N.E. Cor 3rd & Chestnut St. Phila

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, February 3 1882

Samuel Insull Esq.

Dear Sir,

Mr Kruesi paid 1st Installment
May 5 1881 — 900
July 30 1881 500 on acct of 2nd
Aug 17 1881 1000 to bal " " "
Oct 26 1881 500 3rd Installment
" 26 1881 400 on acct of final "
Nov 27 1881 1600 to bal " " "
Mr Edison paid
June 6 1881 870 1st Installment
July 9 1881 1450 2nd "
Nov 10 1881 580 3 " "
Nov 10 188 2000 final "

Yours truly
John Kruesi
pch

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, Feby 20 1882

John Randolph Esq
Menlo Park N. J.

Dear Sir,

You will find upstairs in the laboratory in the show case a lot of silk like enclosed sample. Please send me by mail a small strand of it, but take it off so that we can get long fibers for galvanometers.

Yours truly
John Kruesi

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

Miscellaneous
Biddulph

New York, 23 July 1882

Ans
7/28/82

My dear Sir

Please give me an order to get some of the "Berthoud Borel Cable you got in Gorle Street and tell me also to whom I have to send as Francis I believe has gone to Europe.

Very truly Yours
Lord Biddulph

P.S. I must ask you to excuse me that I do not come up to town but I have such a cold that I cannot go up three flights.

This agreement entered into this —— day of February by and between the Edison Electric Light Company a corporation organized under the laws of the state of New York and having its principal office in the City of New York party of the first part and hereinafter called the ~~Light~~ Electric Light Company and John Bruezi of the City County and State of New York party of the second part and hereinafter called Bruezi, Witnesseth,

First, The Electric Light Co is desirous of obtaining a supply now and hereafter of Electric Lighting Mains or Conductors and junction boxes, of such a character as is more particularly set forth in a specification hereunto annexed

Second, The Electric Light Co recognizing that the manufacture of such Electric mains and appliances connected therewith as is fully set forth in the annexed specification is a new art ~~accomplishing the end for the Mechanism for the economical and rapid production~~ in necessitating the devising of ~~mechanism~~ means and methods mechanical or otherwise for the rapid and economical manufacture of the same, and that in the present state of the art

The cost of ~~[illegible]~~ experimenting erecting and conducting such an manufacturing is necessarily subject to great fluctuations from any estimates that can be now made at the present time ~~[illegible]~~ rendering the enterprise highly speculative and commercially ~~[illegible]~~, hazardous, therefore the said Light Company is willing to ~~[illegible]~~ grant to the said John Krueger the sole ~~an~~ exclusive right to manufacture all the apparatus set forth in ~~the~~ specification hereunto annexed, for 1 or any of its licenses for a period of three years from the date hereof at the price hereinafter set forth, to the end that the said Krueger may be protected from ~~any~~ loss which and ensure from being deprived of ~~a market~~ the manufacture of such apparatus and has encouragement in point of no value;

On the part of the said Krueger he is willing ~~[illegible]~~ first to proceed immediately to the ~~[illegible]~~ devising an erection of a works provided with means for a daily output of one mile of street mains, and 250 furnaces,

2nd = To carry out faithfully all the stipulations as set forth in the specifications annexed.

3rd To increase the daily output to any extent that may hereafter be required by the said Light Co during the said period of three years providing always that the said Lamp Co shall only be entitled to call for such an increase of daily output and the consequent extra investment of money by the said Kruzi unless the said Lamp Co shall give to the said Kruzi such an order for materials as will enable him to pay for the extra investment so required by the profits derived from such order.

4th = For the sole and exclusive right to manufacture, and the payment by the said Electric Light Co for all articles ordered within 10 days of their delivery or tender to deliver to any authorized agent of the said Electric Light Co, the said Kruzi is willing to limit his profits to ~~fifteen per cent upon his plant~~ and Three cents per

foot of main and, 5 cents per junction box of the smaller size and 2.5 cents per junction box of the larger size, providing the total profits ~~for the~~ received in this manner in the first year shall be sufficient to pay 18 per cent net profit upon the investment ~~[illegible]~~

Therefore be it agreed ~~by and between~~ ~~the said~~ on the part of the said Lamp Company, that it hereby grants to the said Bergi the sole and exclusive right to manufacture for the said Light Co or its licensees under any and all of its patent granted or to be granted which it is now or may be possessed for a period of three years from the date hereof relating to underground conductors and junction boxes, upon the conditions above recited, and the said Electric Light Co expressly stipulates that it will cause by good and sufficient contract each and every person who shall become its licensee or to whom it may sell its patent rights or ~~who~~ to purchase from the said Bergi during the period above recited all the electric mains & junction boxes which such person, persons, licensees may use, ~~at~~ the price

upon the conditions
~~as~~ herein set forth, and the
said Electric Light Company
~~[illegible]~~ agrees to the conditions
set forth by the said Kungi in
Clauses 1, 2, 3, & 4, and further agrees
to perform and carry out the conditions set forth by the
clauses 1 & 2.
The said Kungi on his part hereby
agrees to deliver pipes & junction boxes,
at the rate of one mile of pipe per day,
with the necessary junction boxes for
the same within ~~forty~~ days from the date
hereof.

In witness

Extract from letter of Messrs Ed. Kendall & Co. Valparaiso, Chili

April 1st 1882.

"One word we have to say about these mains the iron pipes "with copper conductors inside. It seems to us that the substance "used for filling the pipe and insulating the conductors will "have to be altered, as with the slightest exposure to the Sun "it melts and runs out and it is possible the conductors may "come into contact with one and other or the iron pipe or very "dangerously near to one and other. This is hardly likely to "occur when once underground but during the voyage or landing, transport or process of laying, it may easily and will occur that "they are exposed to the powerful heat of the Sun. We noticed "this from the small sample pieces we have here, being exposed for "a very short time to the Sun in this office window, the tar "melted, ran out and left the pipe half empty before it was noti-"ced."

E. Biedermann,
New York.
P. O. Box 56.

New York 11 April 1882

My dear Sir

I will be at your place 65 Fifth Avenue this evening at 9 o'clock and will have the draft of the contract with me

Yours very truly

Ernst Biedermann

Thos. A. Edison Esq.

Miscellaneous

E. Biedermann,
New York.
P. O. Box 56.

New York 19 April 1882
Biedermann

My dear Mr. Insull

Will you please drop me a line and let me know how Mr. Edison is and when you expect that I can see him on business. —

The Boone will bring me your note. —

Please excuse my troubling you and believe me my

Dear Sir

Yours very truly

Ernst Biedermann

Answ. 9 ds may 9n

FREDERIC B. ESLER,

BANKER,

Northeast Corner Third and Chestnut Streets.

CONNECTED BY PRIVATE TELEGRAPH WIRE WITH COLGRON, DAY & FIELD, 17 NEW STREET, NEW YORK.

I think the Bethod Borel Cable

Philadelphia, May 5 1882

is the most practicable cable

Mr. Thomas A. Edison, at present made &

Dear Sir do not see where

determination can

Mr. E. Biederman take place

informs me you have had in use for several months the Berloud Borel underground cable represented by him and owned by the U. S. Underground Cable Company. There are several companies organized in this city to lay underground wires all of them claiming more or less merit. Experiments have been made here with the Berloud Borel cable and have resulted satisfactorily, but the question of durability of the insulation etc. can only be determined to the satisfaction of the experimentors by time, or the opinion of a competent judge who has practically tested it for a long time. Mr. Biederman having referred my friends to you in a letter dated May 2. 1882. I have taken the liberty of addressing you If I am not trespassing upon your time already necessarily very much occupied. I should feel indebted if you would give me your experience with the Cable.

Yours very truly

Frederic B. Esler

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, May 10th 1882

T. A. Edison Esq.

My Dear Sir

The man who brought the enclosed Form of Statement says he sent it to you long ago but never heard from you. It should have been returned the 30th of April last.

Please attend or instruct (particular on Item Amount of surplus Earnings.)

Truly yours

J Kruesi

P.S. The Balance Jan. 1st was $ 72 00 00
But the stock was taken at the selling price
And no Depreciation on Tool & appliances allowed
Tool & appliance account $ 11628 59/100 25% off
Pattern acct. $ 2951.22

	25%	2907.17
	Patterns	2951.22
		5858.39
		7220.05
		5858.39
net		$ 1362.66

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

NUMBER	SENT BY	REC'D BY	CHECK
4	K.J.	H.S.	16 Paid

Received at N.Y. 4.10 P.M. May 11th 1882.

Dated New York

To Mr Insull

Please send me copy of Contract with Mr Edison immediately as I must have it tomorrow.

Bidermann

Thomas A. Edison Esquire
Menlo Park New Jersey

See Kruzi

Dear Sir

I called upon Capt. Eaton at your 5th Ave. Office upon suggestion of Mr. Flagler but did not consider my affairs any safer & second thought struck me that you would prefer to take the matter up for your exclusive benefit. I have a patented process of manufacturing tubes & pipes for telephone Electric & Telegraph wires that will revolutionize the present articles now in use. It also makes a desirable water pipe. Will stand 300 lb. pressure to the square inch, is an insulator or non conductor; is imperishable under ground is lighter and cheaper and easily tapped. The Hon. Wm. J. McAlpine C. E., James Manning Agent of Otto Silent Gas Engine, Julius Jordan Engineer Croton Aqueduct have all given certificate upon it and endorsed its merits.

There is an immense fortune in it and I feel before giving it away to the Co. that you would wish to have all its benefits privately

A few thousand dollars will put it in working order. Will not sell the whole right. One half can be obtained for $15,000 upon easy terms say $8,000 cash balance 2-4-6 mos. We think of selling N. E. States N. York & N. Jersey to work for all it is worth and balance of States and Territories on Royalty but if you take the half can manage it as you please as we will give you full management. If you are not in the city often I could call upon you at Bensel Park Am in office from 8.30 to 10.30 A.M. and 3-4 P.M. if you call between these hours and do not find me in if you will leave a note on my desk what hour you will call again I will be in promptly. Yours Very Respectfully

Wm. H. Harrison

173 Broadway Room 5

N.Y. 5/18/82

Handed him
by Thomas Remedes
second COPY

York 19 May 1882

Insull

Please give Bearer another set of the Swiss Contracts I mean the same Copies you gave me last week besides also the Copy of our Original Contract and oblige

Yours very truly

Ernst Biderwann

30

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

Kruesi

May 22 82

RECEIVED
MAY 23 1882
ANSWERED

New York, Albany 22d 1882

Mr. Edison 188

FILED

Have adjusted the insurance to pretty good satisfaction and can go on now without delay. I am getting $3160.00

Have recd. your sketch for joints but was to busy to consider will let you know in a day or two.

Chas L. Gore of the Gore Underground Wire Co came to see me & wants to negotiate about our Compound & the filling of the tubes for them. Shall I find out what he wants or decline answer

over

Truly yours
J Kruesi

Have all feeders inside of vault now & can bring them to Engine room in rainy weather. Street work will not be delayed on act. of Fire.

K.

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, May 23 1882

Samuel Insull Esq
Menlo Park New Jersey

Dear Sir,

We are greatly in need of money, please get Mr Edison to send us a check to balance his account which amounts to $580 38/100

Yours truly

THE ELECTRIC TUBE CO.

Johnson.

571.03.

30

The Electric Tube Company,
65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, May 25 1882

T. A. Edison Esq
Menlo Park New Jersey

Dear Sir,

The Gore underground wire company, want us to lay their first experimental line, consisting of 10 wires & running from the police head quarters to the 15th Precinct station, about 2000 feet.

They have a permit to lay the line in any part of the street to suit their convenience. They propose to put 10 copper wires (# 13 Band gauge) with porcelain beds of ½ inch diameter by ¼" thick, 6 inches apart in a 1½ inch wrought iron pipe, to lay the pipe in & fill it with our compound

The Electric Tube Company,
65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, 188

They promise liberally all their future work to the company or Party who will do a good job for them now, also that they will make any body we desire a director of their company in order to give us a chance to have a voice in the matter.

I have told them I would let you decide whether we would do it or not. They are very much in a hurry to have an answer I would like to do it some where outside of New York for the sake of gaining experience but not in N.Y. City.

Please let me know what you think of it.

Truly yours John Kruesi

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, May 25 1882

Samuel Insull Esq
Menlo Park N. J.

Dear Sir,

Your favor of the 24 inst is to hand, we shall strictly adhere to your instructions

Yours truly

THE ELECTRIC TUBE CO.

Johnson

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, May 26 1882

Samuel Insull Esq
Menlo Park New Jersey
Dear Sir.

In answer to your favor of the 26th inst. say that we will attend to Drexel Morgan & Co's, it can be done & I will inform the proper party about covering.

The vault in Menlo is to my knowledge perfectly dry; the iron doors with combination lock are out in the shop & can be put on by the men you have there, Logan can attend to it. The lock is for a right hand door, in your case it must be reversed for a left hand door, which can easily be done. Marvin Safe Co made

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, 188

the lock & if you would rather send it to them they can easily change it without having the doors

Yours truly
John Kruesi
Jchmd

Y

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

May

New York, ... 188

Price List of Tubes &c

No or Siz	Cost per ft	Circular Mils per ft in each conductor	Weight per ft	Diameter
1	$4.05	1.639.890	10.24 lb	3/4"
1½	3.10	1.296 419	7.95	3
2	2.25	862.996	5.85	2¾
2½	1.85	671.362	4.12	2½
2¾	1.50	494.541	3.17	2¼
3	.80	262.951	1.60	2
4	60	182,884	1.10	1'9"
5	45	107289	0.64	1.35"
6	35	66581	0.42	1.35"
7	27	33015	0.21	1—"

#3 are used in New York as mains 2¾ to 1 as FEEDERS & 4 to 7 as service house pipe

Insulating Compound 10¢ per lb.
" Tape 40¢ " "

Tape covered copper wire or cable
1 strand or single wire covered with 2 layers of tape 50¢ lb.
2 " " wires together " " 2 " " " 42¢,
2 wires covered with 1 layer each separate the two together after with 2 layers 83¢ lb.
3 wires together 2 layers of tape 45¢,
4 " " " " " " 43¢,
4 " " 3 " " " " 48 "
5 " " " " " " 46 "

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, ... 188

Feeder Coupling boxes for 1, 1½, 2, 2½ & 2¾ $2.90

Coupling box for # 3	$1.92	Joint # 3	pair .75
Joint # 1½ pair	2.70	" # 2 "	2.25
" # 2½ "	1.94	" " 2¾ "	1.37
Service box	$2.15	Joint	1.10
Cross "	$4.32	"	2.04
Tee " "	$3.34	"	1.65
Elbow box for # 3. 2¾			2.38
" " " 2½ & 1½ & 1			2.80

Joints # 1½	$3.27
" # 2	$2.50
" # 2½	$2.04
" # 2¾	$1.32

The prices for the boxes include covers, bolts, plugs, cards, board & fuses that belong inside. Without those the prices will be from 30 to 40% per boxes

Elbow house box

#3 box	0.85	Joints	1.35
4 "	.85	"	1.25
5 "	.75	"	.55
6 "	.75	"	.55
7 "	.70	"	.50

House Coupling box

#3 Box	0.94	Joints	0.56
4 "	.90	"	.52
5 "	.80	"	.45
6 "	.80	"	.42
7 "	.75	"	.28
2¾ "	1.50	"	1.03

House Tee joint any size from 7-3 .50

" " box " " " 7-3 2.00

The Electric Tube Company,
65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, June 1 1882

Thos. A. Edison Esq
Menlo Park N. J.

Dear Sir,

I will look at Ballard's place in East Newark, but really do not think that East Newark is a good place for us, because our goods & the material we use are so heavy & unless we get it by loads we would experience great trouble in getting our rods & tubes there, because they are so long. No railroad company takes any goods longer than 17 feet, unless there is a car load. We have had to cut our tubes in two to ship them to Chicago.

2

The Electric Tube Company,
65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, 188

I consider New York the terminus of all rail roads & therefore think it is the best place for us. Nevertheless I will go over & see the place, it may be of some use.

Your order for 12 3/4 tubes for London has been received & entered, will give it prompt attention: we had copper enough in stock to fill your order, but have already ordered it & succeeded in getting 1¢ per lb off as it is an export order. I intend to give them the benefit of the reduction. Should you think different let me know.

I do not expect to be able

3.

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, ... 188

to ship them before 3 weeks. As to the joints I don't know whether they want to branch off or whether it is a straight line, would it not be best for you to cable them to send us a plan or order by mail saying so many elbows, couplings, or services &c; or shall we send them a lot of each kind?

The average price of a #23/4 joint is about $1 30/100 & the average prices for boxes of the same size of tubes is $2 10/100.

Your check of $265 69/100 on account has been rec'd & we have placed same to your credit

Yours truly John Kruesi.

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, June 6 1882

Thos A. Edison Esq
Menlo Park N.J.

Dear Sir,

I have just made a test of feeder #6 terminating Electric & Dutch length 1222 feet size #2 1 cell through 258,000 ohms 131 m/m through FEEDER with 200 cells between copper & iron 490 m/m = 13,800,000 ohms

" copper & iron 225 "
" " " " 225 "
" iron & copper 85 "
" " " " 95 "
" " " " 115 "
" " " " 100 "
" " " iron 100 "
" " " " 80 "
" 2 wires 410 " = 17,000,000 ohms

2

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, 188

which is about fully 5 times the expected resistance.

Please answer my letter in regard to points for London order.

Yours truly
John Kruesi

Dr Sir your Mr Cruzi has
not called to see the Cast
Newark Foundry Jet. Will
you please instruct him to
call for the owners have
authorized me to put it in the
market to lease or sell
Newark NJ Yours Truly
June 9. 82 Geo. U Ballard

30

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, June 9 1882

Editor Insull
Send Enclosed
Certificates signed

Tell Mr Edison
~~that~~ I am unable
to spend any time
on the Lead tube Experiment
for 2 weeks yet
if he has a chance to
do it sooner would
like better to do it.
Kruesi

The Electric Tube Company,

65 Washington St.

J. A. EATON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, June 11th 1882

Dear Edison

Please arrange that Hurth & I can be heard the same day, if we can talk the matter over we may refresh each others memory —

We have observed a very unexpected phenomena in our Junction Safety Catch boxes. Friday night we opened one which was put in long ago, when the inside cover was taken off a lot of gas escaped, and when one of the men came near with a light it blazed up & burned for about 5 minutes (singed a man's hair) and was put out with a pair of bellows. Today again we had to open one in daytime the escape of gas was the same only was not ignited.

It may cause trouble if a man had to break a connection when the current is on the spark may ignite it. I suppose it comes from the compound. We may have to put two plugs in the inside cover & blow out the gas occasionally what do you think of it?

Truly yours

J Kruesi

Ans June 8th 82

The Electric Tube Company.

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, June 8th 1882

Mr. Insull

Will you kindly send me 2 Photographs of Mr. Edison.

You will oblige
Yours truly
J Kruesi

Shall I send you the 18 Shares? Or will you call for them

OFFICE OF
THE UNITED STATES ROLLING STOCK CO.,
35 BROADWAY,
~~NEW 23 PARK STREET,~~

New York, June 23 1882

Dear Mr Edison,

Will it be possible for you to see me and another gentleman at 65 Fifth Avenue or any other place in the City at 3 o'clock this afternoon? I would like to confer with you on Underground Cable matters and you would greatly oblige me if you can possibly comply with my request.

Yours very truly
A. Hegewisch
C.B.

Thomas A. Edison, Esq.

File

Off Sandy Hook
24 June 82

My dear Edison

Thanks for all please write me to London care Stern Brothers London E.C. that you will accept manager of Berthond Boul Underground Cable Company if the money is paid up. —

Very Truly Yours
Ernst Bindemann

The Electric Tube Company,

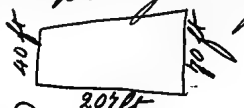
65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, June 27th 1882

Mr. Edison

I have not been able to find a suitable factory in N.Y. City yet. Can get factory sites & good ones too, but it takes too long to build. I have a splendid factory in Brooklyn, fronting on three streets & lighted from 4 sides, I will bill Size



3 Stories And basement Has 2 good 60 H.P. boilers and 50 H P Corliss Engine (good) first-class Steam-pumps, Pullys & Shafting, large smoke stack, Otis Elevator, Fairbanks Scales, Stables for 10 horses large good drying room. Can buy it with all thats in it for $50000.00 perhaps a little less or lease it for 5000.00. Could easy get a mortgage on it for $40000.00 at 6% 2400 interest

on $10000 would equal to 600 $3000.00 rent,

Will you come to look at it? if so Come soon

And let me know before in order to get the owner there.

Want until weight up 10 or 15 floors on the slatter then can decide

Yours truly
J. Kruesi

46

The Electric Tube Company,
65 Washington St.
Kruesi

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, June 30 1882

T. A. Edison Esq
Menlo Park New Jersey
Dear Sir,

In regard to the prices of tubes for the London company I would say that I gave them the same price as we charged the Edison Electric Illuminating Company of N. J. in the 1st district, and can afford to give any discount as long as we are in this shop. I admit that if we had a suitable factory, provided with the necessary appliances, a reduction in the price may be possible, perhaps 10 or 15 %

Yours truly
John Kruesi

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company **TRANSMITS** and **DELIVERS** messages only on conditions limiting its liability, which have been assented to by the sender of the following message. Errors can be guarded against only by repeating a message back to the sending station for comparison, and the company will not hold itself liable for errors or delays in transmission or delivery of **Unrepeated Messages**, beyond the amount of tolls paid thereon, nor in any case where the claim is not presented in writing within sixty days after sending the message. This is an **UNREPEATED MESSAGE** and is delivered by request of the sender, under the conditions named above.

THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY		CHECK
14	20n	E	N Reid	

Received at Menlo Park Depot 7/3 1882

Dated, New York 3 10 55 AM

To Edison

Can I see you in Menlo Park this afternoon answer

John Kruesi
65 Washington St
New York City

LORD, DAY & LORD.

Daniel D. Lord.
Henry Day.
Geo. De Forest Lord.
Daniel Lord, Jr.
Franklin B. Lord.

37

Equitable Building, 120 Broadway,

New York, July 13th 1882

Thomas A. Edison Esqre
Menlo Park Bertholdi Cable
New Jersey

Dear Sir, I called on Mr. Coles as you suggested, and found that he was not disposed to go into the matter of the Bertholdi Borel Cables as his Company had so many other matters on hand. — I think it would be a great advantage to us if you could interest some of your friends in the matter; and I should be glad to see you on the subject as I can perhaps make some suggestions which may be of mutual advantage.

If you will let me know when you will be in the City, I will call upon you, or, will make an appointment here at any time that you may wish.

Truly yours
Dan Lord Jr

will call when I am in the City

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This is an UNREPEATED MESSAGE, and is delivered by request of the sender, under the conditions named above.

THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY	CHECK
4	Wre	E	9 Paid

Received at Menlo Park Depot 7/20 1882

Dated Newyork No 20

To Mrs Edison

Can I see you at Menlo
this afternoon answer

Kruesi

Sent to Mott by Tom

30

The Electric Tube Company,

65 Washington St.

T. A. EDISON Pres.
JOHN KRUESI, Treas,
SAMUEL INSULL, Sec'y.

New York, August 3 1882

Thomas A. Edison Esq
Menlo Park N. J.

Dear Sir

The Agent who has seen Col Hewitt was here to-day. I told him to write to Col Hunt to extend the refusal for us until the 10th of this month. I had the statement ready for you yesterday but could not find you. If it is possible please call to-morrow morning at 65 Washington Street.

I am afraid we may miss getting that plot unless we act soon. The Agent says it is this way with Col Hunt, he does not need any money but if he sells the property & takes a mortgage on it he gets interest & at the same time

2

The Electric Tube Company,

65 Washington St.

T. A. EDISON Pres.
JOHN KRUESI, Treas,
SAMUEL INSULL, Sec'y.

New York, _____ 188

escape taxation in Brooklyn. He will give a deed if we pay $3000 or $4000 & let us pay the rest in ten years any way we like. Or if we do not pay anything down he will make a contract & give us a deed as soon as there are buildings enough on the property to cover expense of a foreclosure.

All he wants is to secure himself a fair deal & good faith

Yours truly
John Kruesi

The Electric Tube Company,

65 Washington St.

T. A. EDISON Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, August 3 1882

Samuel Insull Esq
Menlo Park New Jersey

Dear Sir,

Our due # 78 is not definate enough that we could ship the boxes. We wish they would distinctly say if they wish them for further models or a small order. in the latter case we could give them our bottom prices on the boxes, if they expect to order more. if not we would like them to wait until we get the new style boxes, the patterns of which are now being made.

We must know the size of the boxes, (what number of tubes

The Electric Tube Company,

65 Washington St.

T. A. EDISON Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, 188

they wish them for). As we did not sell them any tubes ~~we~~ don't know if they ever had any, we do not know which size they wish.

Yours truly

THE ELECTRIC TUBE CO.

J Schmid.

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

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This is an UNREPEATED MESSAGE, and is delivered by request of the sender, under the conditions named above.

THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	READ BY	CHECK
2	Pure E	10 Paid	

Received at Menlo Park Depot Aug 4 1882.

Dated Newyork 4 10 30 am

To T A Edison

Will you be in town today if so what time

Kruesi

G

2

8

Encl.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 4th August, 1882.

T. A. Edison, Esq.,
Menlo Park,
New Jersey, U.S.A.

Dear Sir,

Insulating Compound.

Learning that the Manufacture of this Compound is held secret by you, I am desired by the Directors to enquire whether you would feel willing to impart to them in confidence, the process employed by you in making this Material, as having here in England all the necessary ingredients, it is thought that a substantial saving could be effected in this direction, were the Company allowed to manufacture for themselves.

I am, Dear Sir,
Yours truly,
Arnold White
Secretary.
pro E.E.L.C.

P.S. I forward you enclosed Order for 1 Barrel of Compound.
AW
pro E.E.L.C.

46

The Electric Tube Company,

65 Washington St.

T. A. EDISON Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, August 26 1882

Thomas A Edison Esq
Menlo Park New Jersey

Dear Sir

On account of strikes in the rolling mills in Pensylvania it will not be possible to furnish the tubes in time for Mr Batchelors order, particular not those for Brunn.

Will give you full particulars on Monday, which please telegraph to Mr Batchelor.

Yours truly
J Kruesi
S

46

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, Aug 28 1882

Samuel Insull Esq
Menlo Park N. J.

Dear Sir,

Please telegraph Mr Batchelor

"Strike delay shipping of tubes 3 weeks"

I have heard from the tube mill to-day, that we can get tubes for Munich order # 79 early next week for Brunn order # 80 and will substitute a tube which we can get by the end of next week

Yours truly
THE ELECTRIC TUBE CO.
Samuel

46

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, Sept 13 1882

Thomas A. Edison
Menlo Park N. J.

Dear Sir.

Below find explanations of goods sent to Brunn & Munich that were not called for on the order, but were ordered by Mr Bailey upon your suggestion.

cases #2, 3 & 4 for Brunn & 7, 8 & 9 for Munich contain a small farmers boiler, for melting the compound, each.

The Insulating compound, Generator, lead lined tubs, safety catches wrenches for plugs, bolts & set screws, hide faced hammers & alcohol lamps were by Mr Bailey's order

2

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, 188

The plugs in case 12 for Brunn are in case any tubes have to be cut or if the original plugs get very loose.

Yours truly

THE ELECTRIC TUBE CO.

Johnson

46

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, Sept 13 1882

Samuel Insull Esq
Menlo Park N. J.

Dear Sir

We are very much in need of money & should pay the Ansonia Brass & Copper Company $6000 00/100 before ordering the copper for Milano. So please let us have a check for all of our bills yet due.

Yours truly

THE ELECTRIC TUBE CO.

Jehnrd.

The Electric Tube Company,

65 Washington St.

T. A. EDISON Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, October 7 1882

Mr Thomas A. Edison
65 5th Avenue City

Dear Sir,

Please send us the name of the Edison Company of Milan, we wish to know this because we wish to put the initials on the covers of the junction safety catch boxes

Yours truly

THE ELECTRIC TUBE CO.

Jel

Couldnt put it on a basis of profit as we do not see the wire out use it ourself.

RECEIVED OCT 23 1882 ANSWERED FILE NO.

I think my offer to you was the best thing any one would do who intended to use the invention in a legitimate proper manner of course you might profitably do better by other methods but time would probably show that my offer was the best.

Providence Oct. 21 82

Mr T. A. Edison

Dear Sir

I was expecting to be in New York today and see you personally but as my business is such it is an impossibility

PS=My Supt very much desires to have a small sample of the wire please direct

Will you give me ten thousand ($10,000.) Dollars cash to John Kurz Electric Subway 65 washington st

for that Machine for covering wires and one eighth (⅛) of the net profits on all wire covered by this Machine and for the use of your Company only? and give you the working plans so you can build Machines and for all improvements that you suggest or any one in your employ to give us one half interest or rather assign one half interest in the improvements so made,

I consider the Machine perfect as it is and can see no way to make an improvement but as you well know, there are always improvements that can be made and I suppose you may see some way for improvement. we shall keep experimenting and all improvements we shall make we will let you have the benefit of it.

We will attend personally to all matters which you may require and assist as far as we can in building the Machine

I have had several very

good offers, far above the proposition I have made you, but I am fully aware that if you make it a success others will have to follow in your footsteps and I will make a great concession to you on account of this very fact.

I have a new insulator, which is non-combustible and I consider it a great improvement over anything that has been invented. I will bring a sample for your inspection the next time I am in New York which will probably be next week. Waiting an early answer I am Yours Most Respy.

Wm F. Macomber
#49 Weybosset St. Providence R.I.

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

RECEIVED
OCT 28 1882
ANSW

New York, October 27 188 2.

FILE No. 36

Thomas A. Edison Esq
65 5th Avenue City

Dear Sir,

I have examined the lead covered wire, Mr Mc Combie showed me & found it better than I expected, but not as good as it should be. after handling it a little while the seam opened & showed plain that it was not soldered on that place, & I doubt if the soldering can be done infalable perfect at a high rate of speed.
Short defects will occur & are at that rate of speed likely to pass through the

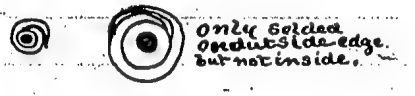
The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, 188

finishing die unobserved & can only, by chance, be found afterward.
Enclosed find a small piece which came off a badly soldered seam. See sketch.



Yours truly
John Kruesi
Pres.

Nov 14

The Electric Tube Company,

65 Washington St.

T. A. EDISON, Pres.
JOHN KRUESI, Treas.
SAMUEL INSULL, Sec'y.

New York, ... 188

Present Factory

Capacity 1/2 mile a week

Machinery & Tools	14000	
Patterns	5000	
Furniture & Fixtures	2000	
Drawings	2000	
Plant		23000
Average completed Stock & material on hand		16000
Average monthly bills & pay roll		24000

New Factory

Capacity one mile a week

Plant	50,000
Average completed Stock & material on hand	25000
Average monthly Bills & Pay roll	40000

Form No. 1.

New York, Nov 22 1887

The Electric Tube Co.,

65 Washington Street.

Order No. .....

For .....

Through Price List

	PIECES.	1	1½	2	2½	2¾ Street.	2¾ House.	3 Street.	3 House.	4 Street.	4 House.	5	6	7	REMARKS.
BOXES.	Coupling	3.15	3.15	2.90	2.80	2.80	1.20	2.30	.75	2.30	.75	.62	.62	.58	
	Elbow	3.22	3.22	2.97	—	—	1.12	2.42	.77	2.42	.77	.62	.62	.60	
	Tee	—	—	—	—	—	—	2.65	1.10	2.65	1.10	1.10	1.00	1.00	
	Service	—	—	—	—	—	—	2.55	—	2.55	—	—	—	—	
	Wire Branch	—	—	—	—	—	—	—	1.50	—	1.50	1.45	1.45	1.45	Add 7¢ for rubber bushings to the Coupling boxes.
	Cross	—	—	—	—	—	—	—		—					
JOINTS.	Expansion Coupling	4.85	3.22	2.27	1.85	1.50	—	1.00	—	.90	—	—	—	—	
	Straight "	1.65	1.45	1.30	1.10	1.00	1.00	.60	.60	.50	.50	.46	.40	.28	
	Rt. Hd. Reverse Coupl'g	—	—	—	—	.75	.75	.65	.65	.56	.56	.48	.40	.32	
	Lft. Hd. " "	—	—	—	—	.75	.75	.65	.65	.56	.56	.48	.40	.32	
	Upright Elbow	4.25	3.05	2.73	2.07	—	1.10	—	.55	.96	.50	.42	.38	.28	
	Flat "	4.30	3.25	2.50	2.20	—	.98	—	.60	.85	.53	.45	.40	.28	
	Reverse "	—	—	—	—	—	.75	—	.65	1.00	.56	.48	.40	.32	
	Service	—	—	—	—	—	—	—	—	1.05	—	—	—	—	
	Tee														
	" (Branch No. 3)	—	—	—	—	—	—	—	1.55	—	1.16	.90	.85	.85	
	" (" 4)	—	—	—	—	—	—	—	1.55	—	1.16	.90	.85	.85	
	" (" 5)	—	—	—	—	—	—	—	1.55	—	1.16	.90	.85	.85	
	" (" 6)	—	—	—	—	—	—	—	1.55	—	1.16	.90	.85	.85	
	" (" 7)	—	—	—	—	—	—	—	1.55	—	1.16	.90	.85	.85	
	Wire Branch	—	—	—	—	—	—	—	.80	—	.75	.55	.52	.50	
	Wire Socket	—	—	—	—	—	—	—	.47	—	.44	.37	.35	.32	
	Wire Clamp	—	—	—	—	—	—	—	—	—	.36	.30	.30	.25	
															Prices subject to change without notice.
MISCEL. & CLAMPS.	Ball Clamps	—	.65	.55	—	—	—	.47	.47	.47	—	.40	.40	—	
	Base Clamps	—	—	—	.55	.55	.55	.55	.55	.55	.55	.50	.50	.50	
	Pick Hole Covers														
	Caps	—	1.25	1.15	.95	.89	.89	.74	.74	.35	.35	.21	.21	.18	
	House Box Rings														
TUBES.	Tubes	4.10	3.35	2.32	2.05	1.85	—	.85	—	—	.70	.45	.37	.25	per foot. New style
	Copper per foot	4.43	3.65	2.57	2.00	1.57	—	1.00			.35	.21	.13	.07	Red Domes are for old style as long as they last.
	Wooden Plugs	3.22	2.56	1.69	1.22	.97	—	.51			.02	.02	.02	.02	
		.03½	.03½	.03	.03	.03	.03	.03	.03	.02					

TAPE.		
12 inch	40	lbs.
1½ "	40	"
1 "	40	"
¾ "	40	"
½ "	40	"
5/8 "	40	

Plugs.	Iron.	Brass.
1 inch Pipe Plug	5¢	
½ " " "	4 "	
⅜ " " "	3 "	
¼ " " "	3 "	
Compound 10¢ lbs.		

Bridge Boxes

Feeder Junction Boxes

Bridge and Junction Box Fittings, see List.

Millboards, see List. Tools, see List.

Providence Nov. 24/82

T. A. Edison Esq

Dear Sir

Please pardon the delay for not sending you those working plans as I promised to. but it has been no fault of mine, as I have had only three men to work and they are all sick with Typhoid Fever. I have a new man who now promises to finish them by middle of next week.

Yours truly Wm. F. Macomber

Mr Lindall

I am much obliged to you for this.

I see we have to wait.

Truly yours

J Kruger

[ATTACHMENT]

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SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'Honneur PARIS 1881

Ivry-sur-Seine, le 2 Decr. 1882.

5, RUE DU PARC.

T. A. Edison Esq.
New York.

Berthoud Borel Cable.

My dear Edison, I find the Berthoud Borel people are so tied up in America with Biederman that they cannot possibly shake him off, and the only thing that I can get them to say is, that if an offer is made to them, they will see how they can settle with Biederman -

I don't know how large an interest Biederman has in it, but I should judge he controls it entirely - One of the Administrators M. de Coulon whom I think you have seen in America told me they were heartily sick of B. and nothing would give them greater pleasure than to see a way of getting rid of him.

Now a few words about the Cable — I find that most of the Arc light people here have used the Cable and discarded it - I put it in the Powder factory plant at St Chamas, and in a few weeks it was so everlastingly crossed up, and grounded that I send a man to fix it

[ATTACHMENT]

387

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 2 Decr. 1882.

5, RUE DU PARC.

I have talked to M. de Caulon about these defects, as I believe myself that the Cable is good, and that it only requires great care in laying.

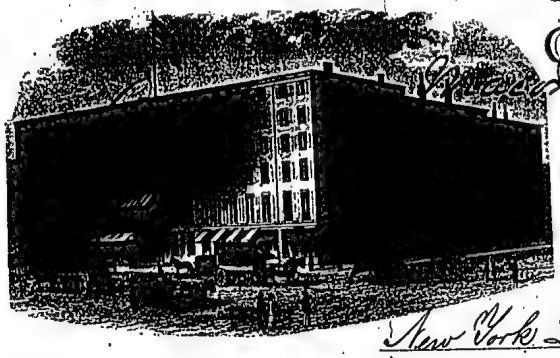
He has sent me 200 mètres to put underground for a trial at the factory, and I shall see it laid, and make a few joints in it, so as to test it good —

I will then write you further about it —

Yours truly

Charles Batchelor

22



Cranston & Bailey's
NEW YORK HOTEL,
721 BROADWAY
NEW YORK.

New York Dec 11th 1882

T. A. Edison Esq

Dear Sir

Will be at your office tomorrow (wednesday) at 11 a.m. with drawings of machine

Yours truly Wm F. Macomber

52 Exchange Place
New York 22 December 1880

Thomas A. Edison Esqre
Menlo Park

My dear Sir,

I am unable to come to see you today and have therefore requested Mr. Turrettini to see you on account of the Cable business. – Mr Banker tells me this morning that ~~you~~ they will have a meeting tomorrow and I should like to give him a letter from you addressed to me or to him in which you state that you intend to have the cables immediately and that you will use the same for your installation in New York. –

I hope you feel quite well and I remain my dear Sir

Yours very sincerely

Ernst Thoresen

1882. Electric Light - Foreign - General (D-82-037)

This folder contains correspondence, agreements, company minutes, and other documents relating to the establishment of electric lighting systems in foreign countries. Many of the documents deal with the affairs of the Edison Spanish Colonial Light Company. Related material can be found in D-82-054 (Telephone - Foreign - Chile).

All the documents have been filmed.

Mr. Edison!

Mr. Stewart seems desirous of having a meter sent to him to Chili. What shall I write him about it? The next steamer sails Jan. 10th. and freight must be put on board by Monday morning of next week.

S. B. Eaton

January 5th. 1881. per He. G

Cant do it —
but can next steamer
Francis can get it ready if
you order him

New York, Jan. 6th 1882.

Dear Sir:

A meeting of the Directors of The Edison Electric Light Company of Havana will be held at the office of Porter, Lowrey, Soren & Stone, on Tuesday, 10th January, at 2 1-2 o'clk P.M.

Respectfully,

J.H. Hostro,

Secretary.

New York, Jan. 9th 1882.

Dear Sir:

A meeting of the Directors of The Edison Electric Light Company of Cuba and Porto Rico, will be held at the Office of Porter, Lowrey, Soren & Stone, on Tuesday, 10th January, at 2 1-2 o'clock P.M.

Respectfully,

Fausto Mora,

Secretary.

Edison Light

John K. Porter.
Grosvenor P. Lowrey.
Geo Wales Soren.
Chas Francis Stone.
Geo. S. Hamlin.
Wm. L. Porter.

P. O. Box 1886.

Porter, Lowrey, Soren & Stone,
Attorneys & Counsellors at Law,
No. 3 Broad St. (DREXEL BUILDING.)

New York, Jan 13 1882

File
Spanish
Gish

Geo Mr Bissell. Please notify Mr Edison that meeting of the Trustees of Edison Colonial Light Co. will be held here today at 4.

Mr Edison should attend if possible.

Yours
G.W.S.

Please also notify Mr Eaton & Dance efficiency.

At a meeting of the Incorporators of the "Edison Spanish Colonial Light Co" held on the 13th January 1882 at the office of Messrs. Porter Lowery Soren & Stone for the purpose of incorporation, Mr. Eaton was called to the chair and the following were nominated Directors of the Co.

Mr. Thomas Alva Edison
" S. B. Eaton.
" Hammond.
" G. P. Lowery.
" F. Stone.
" G. W. Soren.
" F. Moray

On motion of Mr. Lowery to proceed to the election of officers. The following were unanimously elected.

Mr. Thomas Alva Edison	President
" J. M. Meetre.	Secretary.
" Saml. Insell.	Asst. do.
" J. F. Navarro	Treasurer.
" G. W. Soren	Counsel
" J. M. Meetre	Asst. do.

Mr. Lowery moved that out of the 1000 shs. Capital Stock of the Co. 600 shs. representing the nominal value of $60,000 be paid for proprietary rights of letters patent covering the inventions of Mr. Edison on electric lighting & that the counsel be instructed to prepare all the ~~rights~~ papers securing said letters patent to the Co — carried unanimously.

The books for subscription to the stock being opened Mr. J. F. Navarro offered to subscribe for $12,500= of stock @ par in order to enable the Co. to commence business and pay for the expenses already incurred, provided however the Co. give him an option on the balance of the stock pay. $37,500= @ par until April 1st 1883.

There being no other offer Mr. Lowery moved that Mr. Navarro's proposition be accepted and that he be at once authorized to buy plants, engage agents, send powers and do all that may be requisite to carry on the business of the Co. The foregoing was put to the vote and carried unanimously.

The counsel was then instructed to examine patent laws in the island of Cuba and state whether the introduction of apparatus in said island could in any way vitiate the patent rights on same.

Mr. Moray moved that the office of the Co. be located in 71 Broadway R. 33 — carried.

Mr. Hammond then tendered his resignation and Mr. J. F. Navarro was unanimously elected in his stead

Memorandum of
Minutes of
First Meeting of
Edison Spanish
Colonial Light Co.

"Incorporators meeting"

Spanish Colonial Co

Blank No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company **TRANSMITS** and **DELIVERS** messages only on conditions, limiting its liability, which have been assented to by the sender of the following message.
Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of **Unrepeated Messages.**
This message is an **UNREPEATED MESSAGE** and is delivered by request of the sender, under the conditions named above.

A. R. BREWER, Sec'y. NORVIN GREEN, President.

Dated New York Feb. 7 188 2

Received at WH 5.20 Pm

To T. A. Edison

Notify Insull
Sec'y to call meeting
of Cuba Company
one day this week
when you can attend

Sorrow

18 Collect

READ THE NOTICE AT THE TOP.

Union Spanish Colonial Light Co.

[illegible]

[illegible] Edward Bentley

[illegible]

T. A. Edison
S. B. Eaton
Jose Navarro
S. W. Loren
S. P. Fowler
C. F. Stone
F. Mora

EDISON SPANISH COLONIAL LIGHT CO.,
OFFICE, 71 BROADWAY, ROOM 33.
P. O. BOX, 2596.

New York, May 21st 1882

Thomas Alva Edison Esq
65th 5th avenue

Dear Sir:

As this Company has commenced operations under the verbal understanding with you that you will furnish it with instruments lamps machinery fixtures supplies &c at the same price you charge to the "Illuminating" & "Gaslight" Companies & there is no written document to that effect I beg you to address us an official letter stating the terms of our agreement. —

I am, dear Sir
Very truly Yours
J. P. Navarro
Treasurer
p. o. J. N.

THE AMERICAN UNION TELEGRAPH COMPANY is not to be liable for damages arising from any failure to transmit or deliver, or from any error in the transmission or delivery of, an unrepeated telegram, beyond the amount received for sending the same. But to guard against errors, the company will repeat back any telegram, for an extra payment of one-half the regular rate, and in that case it is not to be liable for damages, beyond fifty times the amount received for sending and repeating the telegram.

THE AMERICAN UNION TELEGRAPH COMPANY

THE AMERICAN UNION TELEGRAPH COMPANY is not to be liable in any case for damages, unless the same be claimed, in writing, within sixty days after the receipt of the telegram for transmission. And this company is not to be liable for the act or omission of any other company, but it will endeavor to forward this telegram over the lines of any other telegraph company, necessary to reaching its destination, but only as the agent of the sender and without liability therefor.

LESSEE OF THE DOMINION TELEGRAPH CO. OF CANADA, AND CONNECTING WITH THE FRENCH ATLANTIC CABLE.

Wire No. 54	Sent by Hn	Check 91 Pd
Delivery No.	Rec'd by Oa	Time 3/ 12

Answered at 3800 — 110 WEST 14th STREET, NEAR 6th AVENUE

This Telegram has been received at Mch 4 188

Dated Fort Monroe Va 4 188 upon the above conditions.

To Thos A Edison

65 5 ave ny.

The establishment is like that of the uptown Delmonico but handsomer and about four times the area embracing cafe billiard restaurant ball & lounging rooms. There are over one hundred and fifty lights now I would want a plan of about three hundred lights all of the very best without any that people are very critical here and gas people would make the best of any deficiency Let us start with a handsome

[Form 10.]

THE AMERICAN UNION TELEGRAPH COMPANY is not to be liable for damages arising from any failure to transmit or deliver, or from any error in the transmission or delivery of, an unrepeated telegram, beyond the amount received for sending the same. But to guard against errors, the company will repeat back any telegram, for an extra payment of one-half the regular rate, and in that case it is not to be liable for damages, beyond fifty times the amount received for sending and repeating the telegram.

THE AMERICAN UNION TELEGRAPH COMPANY

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LESSEE OF THE DOMINION TELEGRAPH CO. OF CANADA, AND CONNECTING WITH THE FRENCH ATLANTIC CABLE.

Wire No.	Sent by	Check
Delivery No.	Rec'd by	Time

110 WEST 14th STREET, NEAR 6th AVENUE

This Telegram has been received at 188

Dated 188 upon the above conditions.

To

exhibition what would be the cost of such a plant ten or fifteen per cent more or less

Navarro.

[Form 10.]

Blank No. 1

12 40

THE WESTERN UNION TELEGRAPH COMPANY.

This Company TRANSMITS and DELIVERS messages only on conditions, limiting its liability, which have been assented to by the sender of the following message.

Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages.

This message is an UNREPEATED MESSAGE and is delivered by request of the sender, under the conditions named above.

R. RABLEYER, Sec'y. 3176 NORVIN GREEN, President.

Dated Menlo Park Mar 1881

Received at 791 BROADWAY. Mar 5

To Thos A Edison

Ogden — 5th Ave

Telegram rec'd. Please order plant at once for three hundred light as proposed for Havana to be done as early as possible I shall be responsible for the payment answer

Navarro

answered that all right but Estimate be slightly increased

3 opd by R

READ THE NOTICE AT THE TOP.

THIS TELEGRAM HAS JUST BEEN RECEIVED AT THE OFFICE IN

791 BROADWAY, near Tenth Street,

WHERE ANY REPLY SHOULD BE SENT.

Direct Wires.

The Edison Electric Light Company

65 Fifth Avenue

Norvin Green Pres
S. B. Eaton Vice-Pres
E. P. Fabbri Treas
C. Goddard Sec'y

New York May 9th. 188 2

Thomas A. Edison, Esq.

Menlo Park, N. J.

Dear Sir:-

Permit me to call your attention to the enclosed extract from a letter from Messrs. John Moore & Co. of Brazil relating to the application now pending on behalf of the Edison Company for Patent Rights in Brazil. Your attention is especially called to the importance of the suggestion made that every possible effort be used to prevent any of our apparatus finding its way into Brazil. Will you kindly bear this precaution in mind and notify such persons as you may think important in order that the views of Messrs. Moore & Co. in this regard may be carried out, and the prospect of our getting a patent not be injured by any shipment of apparatus to Brazil, if by extra precaution the same can be prevented.

Respectfully yours,

S. B. Eaton

Vice President.

P.S. I have sent word to London & Paris.

TE

[ENCLOSURE]

Extract from letter of Messrs John Moore & Co. Rio de Janeiro, Brazil, dated April 14th. 1882.

PATENT RIGHTS. " This matter continues to receive our "closest attention and we are now busy looking up all the infor- "mation bearing on the subject so as to assist the commission of "the Chambers in coming to a decision in the style of their report

"We have had interviews with all the members of the "Commission, two of whom appear favorably disposed towards reco- "mmending the priviliege to be granted if precedents can be cited "and the third member (the reporter of the Commission) is not "altogether unfavorable, though as the law at presents stands, "he does not see his way to recommend an unconditional priviliege "the three members however are to discuss the matter shortly and decide upon their action.

"The law of privilieges, which dates as far back as "1830 is very defective and incomplete and a project has however "been brought forward to alter it, and is now before the Senate, "but whether we shall be able to get you the Edison priviliege con "firmed before this alteration is made is uncertain and as matters "of this sort are generally conducted very slowly it is impossible "for us to say how much further delay there will be. You may rest "assured however that our best efforts will be used to push on the "business, as delay is detrimental to all our interests.

"The sale of apparatus in Brazil or in the U. States "or Europenif it finds its way to Brazil before the priviliege is "obtained will prejudice the right of getting such priviliege

[ENCLOSURE]

"and we would therefore recommend precautions being taken against "any such contingency."

J. W. WEXEL,
58 LIBERTY STREET,
P. O. BOX 3112,
NEW YORK.

Ans'd 29 May

WEXEL & DE GRESS,

ESTABLISHED 1865.

NEW YORK AND MEXICO.

F. DE GRESS,
ARMERIA AMERICANA,
1a DE PLATEROS, No. 5,
MEXICO.

New York, May 25th 1882

Thos. Edison Esq
Menlo Park N.J.

Dear Sir

We have been working up the Electric Business in Mexico for some time, and are increasing the same rapidly. And we think that we can handle several of your Manufactures in that Republic.

We have tried to find out, to whom we could apply to for the desired information but have met with no success. We applied to your Office on 5th Avenue, and they referred us to Mr. Don Navarro, we went to his Office, and they referred us to some one else, and so the matter stands

Can we not do business direct with you? or could you give us a letter of introduction to the right parties in this City. So as to enable us to get bottom prices on the different Goods that we handle.

Your kind and early attention to the above request will be appreciated by

Yours Respectfully
Wexel & De Gress

RECEIVED
MAY 31 1882
ANSWERED
31st May 1882
FILE No. 7

Mr Insull,

I hear that Col. Gouraud has sent 4 machines to the Cape of Good Hope for the purpose of lighting the House of Commons there. Also that he has sent two machines to Norway and two to Sweden to be used by merchants. Will you kindly get me the deatils of these things for the Bulletin?

S. B. Eaton

May 29th.1882. per Mc.G.

John K. Porter.
Grosvenor P. Lowrey.
Geo. Wales Soren.
Chas Francis Stone.
Geo. S. Hamlin.
Wm. L. Porter.

P. O. Box 1836.

Porter, Lowrey, Soren & Stone,
Attorneys & Counsellors at Law,
3 Broad St. New York.

RECEIVED
JUN 1 1882
ANSWERED

..... 188... May 31st 1882

FILE NO.....

My dear Insull

Please ask Edison or Mr Dyer if that is the regular thing for some report to Navarro on the Brell storage patent which I referred Mr Dyer to some weeks since.

I have answered Mr Edison's telegram saying that I will go to Menlo by the 11,10 train to-morrow

G. P. L.

EDISON SPANISH COLONIAL LIGHT CO.,
OFFICE, 71 BROADWAY, ROOM 33.
P. O. BOX, 2596.

New York, June 1st 1889

Thomas Alva Edison Esq
Menlo Park N.J.

Dear Sir:

We would like to have at your earliest convenience, to send to Havana for the Exhibition, a "regulator lamp", also a globe and lamp to burn under water. Will you be kind enough to let us know by return mail how soon you will be able to deliver same.

Very truly yours
Edison Spanish Colonial Light Co
per Pond

P.S. Our Havana agent needs at once an engineer & electrician; we have recommended the matter to Mr. Eaton & beg you to aid us in procuring one immediately. Mr. Rich, our engineer, cannot leave the city of Havana to set up the plants used for the plantations.

E.S.C.L.C.

EDISON SPANISH COLONIAL LIGHT CO.,
OFFICE, 71 BROADWAY, ROOM 33.
P. O. BOX, 2596.

New York, June 8th 1889

Thomas Alva Edison Esq
Menlo Park
N.J.

Dear Sir:

We need at once an engineer & electrician to send to Havana & although Maj. Eaton is trying to get him for us I beg you to bear it in mind & send to us a person you may think well qualified to do the work of setting up plants in Cuba. — He must be of sober habits. —

Very truly Yours
F. Mora

P.S. Stevens from Havana are quite satisfactory. —

EDISON SPANISH COLONIAL LIGHT CO.,
OFFICE, 71 BROADWAY, ROOM 33.
P. O. BOX, 2596.

New York, June 9th 1882

Thos. Alva Edison Esq
Menlo Park N.J.

Order from Benguan

Dear Sir:

We addressed you on the 1st inst requesting you to send us a regulator lamp, and a lamp & globe (to burn under water) for the Havana Exhibition. Be pleased to state when we will be likely to have them & if possible send same to our office by express before next Thursday.

Mr Eaton experiences much difficulty in finding the engineer & electrician we want for Cuba; should you happen to know of a proper man for that purpose please address him to us at once.

Very Truly Yours
Edison Spanish Colonial Light Co
F. Mora

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, June 16th 1882

T. A. Edison Esq
Menlo Park,

Dear Sir:

A gentleman called upon me a few days since about the use of the Light for San Domingo - There is not very much in it as San Domingo City is about all there is except a few Sugar plantations - What is your view of the Company's right to deal with this matter. I suppose altho' it is an Island it may be properly regarded as one of the Countries embraced under the general language of the contract between you and the Company

Yours truly

C. Goulard Jr

Thanks Gouraud
Look it up & report

Thanks
Wm Co
Is Navassa
Guano's here

I would
Formulate
Reply

June 17th. 1882.

Thos. Swinyard, Esq.

Dear Sir:-

It is understood that if the Canadian organization is perfected on the basis of my memo. of this date, through your agency, you are to receive a commission of 7 1-2 per cent on the capital of $1,000,000 payable out of the cash and stock to be paid to this Company as per memo. referred to.

Yours truly,

C. Goddard,

Secretary.

MEMORANDUM OF PROPOSED ORGANIZATION IN CANADA.

1st. Company to be organized under Dominion Charter, to take license for the whole of Canada.

Capital Stock $1,000,000.

Shares $100. each.

2nd. Company to establish and equip all necessary works to manufacture all patented articles including dynamos, lamps, fixtures &c.

3rd. Company to supply and erect all "Isolated Plant" through its own organization.

4th. Company to have power to sub license local Illuminating Companies on terms to be limited in Contract with E.E. Lt. Co.

5th. Terms of license to be 50 per cent of the present capital stock and of any future increase thereof of which 15 per cent of such capital shall be payable in cash and the remainder 35 per cent in paid up shares.

6th. No Bond or Mortgage debt to be created by the Canadain Company for the prosecution of its business all capital to be raised through issue of shares.

7th. The present estimate of amount required to establish and conduct the manufacturing and Isolated business is $150,000 to $200,000.

MEMORANDUM OF CAPITALIZATION & TERMS.

Capital		$1,000,000.
	Cash.	
Raise	15 per cent	$150,000.
"	for factory and working	175,000.
	Cash	$ 325,000.

$1,000,000

35 per cent, 350,000 to Light Co.

$650,000, 50 per cent paid in, $325,000.

Subscribers paying 50 per cent instalment on their subscriptions to have option to take full paid shares to half that amount remaining liable for balance on payment of which the remaining shares to be issued.

All expenses in Canada to be borne by promoters of Canadian Company.

Project for a Canadian Edison Light Company.

1. Capital. $1,000,000.

Edison Electric Light Company's share

payable 10 per cent in cash	=	$100,000.	$400,000.
and 30 " " " shares	=	300,000.	

2. Either call in 25 % . . . . . 150,000.

or 30 % . . . . . 180,000.

or 33 1/3 % . . . . . 200,000.

3. The issue of the $300,000. in shares to be so arranged as to work no inequality touching the other stockholders; that is, so that during periods in which the whole stock is not yet called in the American Company will, notwithstanding it may have received its shares in full, be entitled only to 30 % of all property, budiness, dividends, &c. of the Canadian Company or Companies.

The same royalties are to be paid as provided in the Chicago contract, i,e, $2. per horse power of current (or not less than that) in Central Station lighting, but of this the American Company will surrender $1. to the Canadian Company as a special concession.

4. The payment of the $100,000. to be as follows:-

Payable at once	$ 25,000.
Payable out of profits, in money (One half of net profits to be applied to this payment). .	25,000.
Payable as follows:	
Suppose 30 % of the stock were called in it would leave 70 % or $420,000. yet to be called in. As fast as it is called in the American Company to have 12 % or about 1/8 of each call, or when all is called in the American Company to have 12 % or about 1/8 of $420,000. ±	50,000.
	$100,000.

NOTE It is not exactly 1/8 but 11.9 a trifle under 1/8.

5. Out of our 30 % of stock we will give Mr. Swinyard 10 per cent in full of all commissions and charges whatsoever to us. (See 13.)

NOTE As it is probable that Mr. Swinyard's associates will desire him to hold an important relation to the management of the Canadian Company it is assumed that that Company will pay him a salary.

6. This project excludes the District of Montreal for lighting purposes only, for reasons which have been orally discussed and assented to, and Mr. Swinyard engages, in case he should accept and be authorized to act under this project for the

formation of a Company, to offer to Mr. J. J. C. Abbott, Mr. Hamilton, Mr. Ryan, Mr. Hearle of Montreal and such others as have been associated with Mr. Hearle in his applications to the American Company an opportunity to take
per cent of the stock of the Company to be formed.

7. The Canadian Company to receive:-

(1) An exclusive manufacturing license, and to agree to invest at once at least $100,000. in a factory, exclusive of real estate.

(2) Exclusive license for the Isolated business in the Dominion, except Montreal.

(3) Similar license for Illuminating or Central Station business.

8 All these licenses and contracts to be upon the same general terms and conditions (except as to price) as are imposed upon Companies in the United States, and of which the contract with the Chicago Company may be taken as an example.

9 The Canadian Company is to be bound to start at least two Central Stations, or have them started by local Illuminating Companies as follows:

One by July 1st 1883.

One by Jany 1st 1884.

Such Central Statio[illegible]

Such Central Stations to include a general equipment installed and connected for not less than electrical horse power.

10 Conditions of forfeiture for failure in this respect to be same as in Chicago contract.

11. The Canadian Company is not to be brought out or offered to the public in any public manner without the consent of the American Company, it being a fundamental principle of the plan now under consideration that all the capital shall be privately taken.

12 Mr. Swinyard to have until October 1st 1882 for completeing such an organization and raising at least $100,000. in cash for the manufacturing business, and $25,000. to be paid to the American Company on or before that date.

13 As the commission to Mr. Swinyard is intended not only as compensation for organizing his Company but also for remaining with it and acting in the organization of subordinate Companies some suitable arrangement should be made apportioning the payment, so that it will not all be paid immediately upon the American Company receiving its shares.

NOTE. For the purposes of this project it may be assumed

that if the present Dominion Charter is not used a special manufacturing Company may be formed temporarily. Other special Companies may also be formed according as the Edison Electric Light Company of America may be advised by Counsel.

The same proportions of cash and shares shall be paid to the American Company upon all increase of the capital of the Canadian Company.

Edison Electric Light Co.,
Santiago. Chile.

June 22, 1882.

Dear Sir;-

I send you by this mail a specimen of ——? I don't know what, from a museum in Peru. It is said to be practically infusible, a non-conductor of electricity, &c. Small crystals of the same, the size of a finger nail and less, white and straw-colored, can be had by the million at a place four days' journey from here.

Is it good for anything? And would you pay the expense of securing a full lot of samples? If of no use,

will you kindly return ~~[illegible]~~ sample to me. If ~~you want~~ other samples they can be had by the cart load.

Yours Truly,
W.N. Stewart.

Prof. T.A. Edison.

P.S. - I could not land at Guayaquil to get the Panama hat on account of yellow fever quarantine.
W.N.S.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, July 29 1882

T. A. Edison, Esq,

Dear Sir:

Messrs. Fraser & Co. of 73 South St called up on the telephone to ask if you were going to introduce the light in Japan. The above firm have a house both there and in China and would like to take the matter up. They desire to see a representative from you on the matter, or the senior partner of the firm would meet you personally next week if you will appoint a time and place.

Yours truly

Wm. H. Meadowcroft

MEMORANDUM.

From

FABBRI & CHAUNCEY,

48 South Street.

New York, Aug. 7th. 1882.

To Major S. B. Eaton,

65 Fifth Ave.

My dear Sir:-

I enclose a memo. of a proposition to be submitted to the Parent Co. for working the Light in Mexico. I will stop at your office on Friday morning on my way down to give you further particulars. Meanwhile I would say that Mr. Navarro & myself have been working on this thing for the past 3 weeks and it has been with difficulty that we have obtained the proposition in its present shape. The parties are in a hurry to return home & desire as prompt an answer as possible.

Yours truly,

E. G. Fabbri.

[ENCLOSURE]

MEMORANDUM of proposed contract between the Edison Lighting Company of New York and the Spanish American Electric Company of New Orleans:

The representatives of the Spanish American Electric Company propose, in consideration of acquiring from the Edison Company the exclusive proprietorship of all their patents so far as concerns the territory of Mexico - as follows: They will, within one year from the signing, execution and delivery of a contract embodying in legal form all the agreements and mutual obligations included in this instrument, organize for the Republic of Mexico a stock Company with a capital of not less than $200,000. and of so much more as may be deemed necessary for the vigorous and sufficient prosecution of the business. Thirty per cent of the capital stock of this Company shall be delivered, full paid, to the Edison Lighting Company, as payment in full for the rights conferred by them and in satisfaction of all the obligations involved in this instrument, the Spanish American Electric Company hereby binding themselves to purchase from the Edison Company $30,000. worth of the stock acquired by the latter under the operation of this agreement paying for the same the full face value thereof in cash.

It is further understood and is to be incorporated in the Contract hereafter to be executed, that the Spanish American Electric Company will from this day be recognized as

[ENCLOSURE]

the sole agents of the Edison Lighting Company throughout the territory of the Republic of Mexico, the channel through which all business with the Edison Co. must be transacted and their acknowledged and commissioned representatives and transferees. It being additionally provided that in all sales of material made by the Spanish American Electric Company acting as agents for the Edison Company, the latter shall receive thirty per cent of the profits just as though the final arrangement contemplated in this document had been consummated.

And, finally, if the Spanish American Electric Company should fail to perform their part of the contract in organizing a solvent Company upon the terms hereinbefore described and within the period already stipulated, the obligations herein assumed by the Edison Company will be, ipso facto, discharged and all the compacts and conventions growing out of this instrument will be null and void.

New York — E. A. Mexia,

4th. Aug. 1882. — Richd. Weightman.

The H. O. Company will undertake to make at once all necessary exhibitions in Mexico for the purpose of showing the El. Light to the public in the best and most practicable manner.

The Edison Co. will furnish all material for such exhi-

[ENCLOSURE]

bition (as well as for such plant as the N. O. Company may find occasion to sell in Mexico) at cost and will furnish schedule of prices at which the N. O? Co. shall be bound to sell.

Frazar & Co. (of China)
P. O. Box 1165.
Cable address
"Frazar. New York."
73 & 74 South Street.

New York, Aug 16 1882

Thos. A. Edison Esq
The Edison Elec. Light Co
Menlo Park N.J.

Dear Sir.

Not receiving any definite reply from the office of your Company in 5th Ave hotel in response to our applications several weeks since, we address you these few lines to ask whether or not your Company would entertain the matter of introducing your light into Japan? —

We have a house in Yokohama, and our partner there, Mr Lindsley, would take great pains and devote much attention to the introduction of your Light in Tokio, Yokohama, Osaka and other cities should you favor. At first, it would not be advisable to introduce it into Yokohama, which has the largest foreign population, and being but a half hour's ride from the capital, Tokio, with probably a population of one and one half millions.

— If you favor looking into the

matter we shall be pleased to have one of your representatives call at our office, and we will go more into detail with him.

You may have learned that the Brush system has been successfully introduced in Shanghai and the shares are in great demand there at 300 premium the gas at that port being both very poor, and very dear. We feel very confident that we could successfully introduce your system into Japan, if you favor it.

We are dear Sir
Yours faithfully
Frazar & Co
per Smith

My Secretary Mr Insull will call on you Saturday with reference to yours of 16th Aug. 1882

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Aug 24th 1882

T. A. Edison Esq

Dear Sir: Mr Frazar of 73 South St. has a letter from you promising to send Mr Insull to see him on Saturday last relative to the light for Japan - He would very much like to meet you personally in relation to the matter & would meet you at this office on Wednesday next between 9 & 10 am. if convenient to you - Please let me know that I may advise him -

Yours truly
Goddard

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Aug 25th 1882.

Dear Sir:

Mr. Lawson has come on from Canada in the interest of the proposed Canadian Company to gather certain information required for their purposes. Among other things he wishes to know the probable expense of fitting a factory for the manufacture of dynamos. It might probably be assumed that the Company would start with a moderate outfit in this respect. You will probably know better what to advise than anyone else.

Mr. Lawson further wants some statistics in regard to gas Companies in Canada. My impression is that you have some publications from which he can gather this. Will you please give him an opportunity to do so?

Very truly

Sowdard Secy

T. A. Edison Esq.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Aug 30th 1882

Thomas A. Edison Esq
Menlo Park N.J.

Dear Sir:

We have letter from Messrs. Fabbri & Hauncey in which they quote Mr. Stewart, "If an electric motor "of one horse power, or thereabouts, can "yet be had, you will please send "me one with the rest of the machinery, "to be exhibited in operation driving "the lathe at the central station".

Will you please inform me if such a motor can be had, and if so when it will be ready for shipment.

Yours very truly
Edward Johnson Jr.
J.H.

Not for several weeks ~~to~~ I suggest he use a 15 light machine of given 2 hp.

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

NUMBER	SENT BY	REC'D BY	CHECK
27	Bl	E	N Ford

Received at Menlo Park Depot Aug 30 1882.

Dated, New York 30 445 pm

To T A Edison

Please let me have figures asked for by Mr Goddard for Canada soon as possible

A. J. Lawson

(Forwd)

EDISON SPANISH COLONIAL LIGHT CO.
THOMAS ALVA EDISON, *President.*
OFFICE, 71 BROADWAY, ROOM 33.
P. O. BOX 2596.

Answ'd Sept 8th

NEW YORK, September 2d 1882.

Thomas A. Edison Esq.
Menlo Park.

Dear Sir,

In your favor of Aug 10th ult. you quote prices of, 6 K. L. Z & E. dynamos. We should like to know the selling prices of same to outside parties.

An early reply will oblige

Yours Truly,
Edison Spanish Colonial Light Co.
Per N. Villaverde

P.S. Could you at the same time give us the cost price of a motor to run a 15 light Dynamo?
C. S. C. L. Co.

~~Sept: 19th. 1882.~~

T. A. Edison, Esq.

Dear Sir:-

A letter from Mr. Stewart dated Santiago August 4th he says: " this soil abounds in Salt petre which coats up iron pipe. Can this be remedied? Galvanized pipe is not affected.

Yours truly,

C. Goddard,

The Edison Electric Light Company

65 Fifth Avenue

Norvin Green Pres
S. B. Eaton Vice-Pres
E. P. Fabbri Treas
C. Goddard Sec'y

New York Sept. 19th. 188

T. A. Edison, Esq.

Menlo Park,

N. J.

Dear Sir:-

I enclose extract from a recent letter from Mr. Stewart in Santiago. Please let me have your views. I have sent the same extract to Mr. Kruesi and Mr. Clarke.

Yours truly,

C. Goddard

Secretary.

The tubes should be coated with Japan & baked

Mr. Edison:-

Mr. Mc. Carty who went to Brazil and from there to Buenos Ayres has broken down in health from piles and from lung trouble. He is now in the hospital undergoing an operation for piles and cannot attend to his duties. Our dynamo which was run at Buenos Ayres has consequently been stopped.

We are obliged to introduce our light into Uruguay, about 150 miles from Buenos Ayres, within 8 months or ~~xxxx~~ lose our patents. Consequently we need some one down in that region without much delay.

There are several applications for isolated plants in Buenos Ayres but there is no one competent to instal them. There is also some ~~xxxxx~~ talk of a small central station.

We need a first class man to go to that region without delay. He ought to know all about installing and running plants, and the more he knows about central station business the better. He should be a man of good address and good habits.

Will you kindly think the matter over and see if you can suggest a good man for me to send? We have one or two men in view but have reached no decision yet. Will you kindly give this matter your early attention.

S. B. Eaton

October 24th. 1882. per Mc.G.

[FROM SHERBURNE B. EATON]

RECEIVED
NOV 2 1882
ANSWERED
..... 1882
FILE No. 9

Edison — Bergen's latest news from Montreal — I. B. E.

No. 1

Mr. Edison,

They are having a discussion at Santiago about whose name the right through the streets shall be granted, and the City authorities wish to grant it in the name of Thomas A. Edison. Our friends in Chili wish the right to stand in the name of Ed. Kendall who is our agent there. At the time of the last mail the matter was unsettled.

S. B. Eaton,

November 20th. 1882. per Mc.G.

EDISON SPANISH COLONIAL LIGHT CO.
THOMAS ALVA EDISON, *President.*
OFFICE, 71 BROADWAY, ROOM 33.
P. O. BOX 2596.

NEW YORK, Nov 29th 1882

Answered Dec 1, 1882

Dear Sir:

Our agent at Havana requests us to furnish him with an arc light that can be run with the Edison Circuit. It seems that such a light is very convenient in the plantation plants. Will you have the kindness to give us the benefit of your experience in that matter?

Very truly Yours
Edison Spanish Colonial Light Co
[signature]

To Thomas Alva Edison Esq
65 – 5th ave

It is possible to do this using two in series together, But arc lights are not recommended as 13 incandescent lights bunched is equal to one arc light & gives far less trouble. We have several of these bunched groups working & they give great satisfaction

John K. Porter.
Grosvenor H. Lowrey.
Geo. Wales Soren.
Chas. Francis Stone.
Geo. S. Hamlin.
Wm. L. Porter.

P. O. Box 1836.

Porter, Lowrey, Soren & Stone.
Attorneys & Counsellors at Law.
No. 3 Broad St. New York.

_____ 18

Dear Mr Edwin. Please sign this as indicated — to wit.
"Affidavit. T. A. Edwin. Pltf."
& return to us at once.
Lawyer thinks the meeting should be held & confer with Mr Estrada about power of atty to. He is going to Havana next week & meeting important may be arranged with him.

Yours.

Dear Sir:

I beg to send you for execution the papers agreed upon at the last meeting of the Edison Spanish Colonial Co. As Mr. Mestre has left for Havana it will have to be signed by Mr. Edison & you yourself.

Very truly yours
Pablo Ulloa

To Jamel Snell Esq
65 - 5th ave

EDISON, SPANISH-COLONIAL LIGHT COMPANY.

The undersigned hereby subscribe for the number of shares placed opposite the name of each, of the Edison Spanish Colonial Light Company, and agree to pay for the same as called for by the Board of Directors. All shares issued under this subscription to be subject to the conditions expressed in the following By-Laws of the Company.

By-Law.

The capital stock of this Company shall not be increased or decreased at any time without the unanimous consent, expressed by a vote in person or by proxy, of the holders of all the issued shares.

(1882)

PROSPECTO

DE LA

SOCIEDAD ANÓNIMA DE LUZ ELÉCTRICA

"EDISON"

DIRECTORIO:

PRESIDENTE	DR. DON JULIAN BALBIN
TESORERO	D. NICOLAS BOUWER
SECRETARIO	DR. D. ENRIQUE D. PARODI
VOCALES	D. SALVADOR G. GOMEZ
»	D. J. F. SASSENBERG
»	D. FEDERICO J. OLIVENCIA

Capital: 500.000 Pesos m/n.

REPRESENTADO POR

5.000 ACCIONES A 100 PESOS M/N.

PAGADERAS COMO SIGUE:

10 % al suscribirse.
15 % despues de aprobados los Estatutos por el Exmo. Gobierno Nacional.
75 % restante en cinco cuotas de 15 % cuando lo resuelva el Directorio y con prévio aviso de 30 dias.

El objeto de la Sociedad es de suministrar, dentro del radio de la Capital, la Luz Eléctrica del sistema incandescente de Edison, que es el mas perfeccionado, así como tambien suministrar corrientes eléctricas para fuerza motriz y otros usos industriales. La Sociedad ha hecho arreglos para la adquisicion á la Edison Electric Light Cª, de New-York, del uso esclusivo, segun Patentes obtenidas en la República Argentina, de la luz Edison y todas las mejoras que en ella se puedan hacer.

Las utilidades se repartirán como sigue:

5 % para el Directorio.
5 % al fondo de reserva.
5 % para el iniciador D. C. V. Boisot.
85 % á los accionistas en general.

Los suscritores de 20 acciones para arriba tendrán derecho á una rebaja del 10 % en el precio del alumbrado.

LAS SUSCRICIONES

se reciben en el escritorio de los banqueros de la compañia:

S. B. HALE & Cª.

32 - CALLE RECONQUISTA - 32

EN EL ESCRITORIO PROVISORIO DE LA COMPAÑIA

(altos) 36 — CALLE SAN MARTIN — 36 (altos)

Y EN LOS ESCRITORIOS DEL

Dr. D. Julian Balbin, Bolivar Nº 5, altos
y Teófilo Figueroa y Cia, Piedad Nº 130, antiguo.

Buenos Aires, _____ de 188

Señores de la Comision Directiva.

Muy Señores mios:

Me suscribo á _____ *Acciones de la Sociedad Anónima de Luz Eléctrica Edison.*

Total [redacted] $m/n.

Domicilio: _____ *Firma:* _____

1882. Electric Light - Foreign - Europe (D-82-038)

This folder contains correspondence, agreements, articles of incorporation, and other documents relating to the establishment of Edison electric light companies in Europe. Much of the correspondence is by Joshua F. Bailey, Edison's agent in Europe, and by Charles Batchelor, who was in France as Edison's personal representative. Many of the documents deal with three Edison companies incorporated in France in 1882: the Societe Electrique Edison, which built central stations in France; the Compagnie Continentale Edison, which organized and licensed light companies throughout continental Europe; and the Societe Industrielle et Commerciale Edison, which was the European counterpart of the Edison manufacturing companies in the United States. Other documents concern the installation of electric lighting at the Brunn Theater in Munich. Also included is a plan of the Edison exhibit in Munich. Related material can be found in D-82-028 (Electric Light - Edison Electric Light Company of Europe, Ltd. - General) and in the Primary Printed Collection (Company Records Series).

Approximately 50 percent of the documents have been filmed. The following categories of documents have not been filmed: correspondence regarding orders of goods and shipping instructions; bills; duplicate copies of correspondence; copies of cable messages filmed in Letterbook, LM-001 (Letterbook Series).

Exposition Internationale d'Electricité

PALAIS DE L'INDUSTRIE
Salles 24 & 25
DIRECTEURS
M.M. CHARLES BATCHELOR
OTTO A. MOSES

LUMIÈRE ELECTRIQUE EDISON

Paris, le January 2nd 1882/18

Représentants de Mr EDISON

M.M. Pushin & Bailey

33, Avenue de l'Opéra, 33

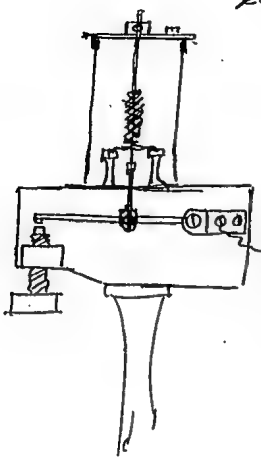
Thos A Edison
65 5th Avenue
New York.

My dear Edison,

Will you have made and sent about 1/2 doz of these lamps and ship them to

Brewer and Jenson
33 Chancery Lane
London

He wants them to exploit Danish patent No 1 Dated May 8th 1879 —



Yours truly
Chas Batchelor

Exposition Internationale d'Electricité

PALAIS DE L'INDUSTRIE
Salles 24 & 25
DIRECTEURS
M.M. CHARLES BATCHELOR
OTTO A. MOSES

LUMIÈRE ÉLECTRIQUE EDISON

Paris, le Jan 2nd 1881 18

Représentants de Mr EDISON

Mr. Mr. Puskas & Bailey

33, Avenue de l'Opéra, 33

Samuel Insul Esq
65 5th Avenue New York.

My dear Insul,

Put in code:—

Constipate = Send ⊔ 2 Dynamos with 60 full lamps each

Constraint:— Send ⊔ 2 Dynamos with 40 full and 40 half lamps with 40 turn off sockets and 40 plain

Construct:— Send ⊔ 2 dynamos with 120 B lamps and all plain sockets

Adjutant: Puskas and Bailey

Consult:— Send ⊔ extra brushes for 2 dynamos

Oblong:— Draw on ⊔

Yours

Batchelor

(Please acknowledge)

Exposition Internationale d'Electricité

PALAIS DE L'INDUSTRIE
Salles 24 & 25
DIRECTEURS
M.M. CHARLES BATCHELOR
OTTO A. MOSES

LUMIÈRE ÉLECTRIQUE EDISON

Paris, le Jan 3 1881 18

Représentants de Mr EDISON

MM. Puskas & Bailey
33 Avenue de l'Opéra, 33

Thos. A. Edison Esq
65 5th Avenue
New York.

My dear Sir

We confirm our cable of last night "Eksbaide Newyork:- send five plants each hundred twenty daughter Puskataily Hamburg also consistent ambrotype each daughter dawning twelve brushes puskataily Barcelona"

Meaning:— "Edison Newyork send 5 plants each 120 B lamps to Puskas and Bailey Hamburg also send one 110 volt machine, regulator, and 60 full lamps with turn off sockets 150 each B and A lamps and 12 Brushes to Puskas and Bailey Barcelona Spain"

Yours truly
Société Electrique Edison
per Batchelor

Mr. Insull:

This is a copy of the letter sent to Mr. Batchelor with the Power of attorney executed by him

M.H.M.

Jan 3/82

[ATTACHMENT]

December, ~~20th~~ 27th.

Mr. Charles Batchelor,

Paris, France.

Dear Sir:-

You will find accompanying this a power of attorney to yourself in the form which has been sent to us by Mr. Porges. Various causes have prevented it from being properly considered and brought to Mr. Edison's attention until now.

It is (with a few exceptions) executed precisely in the form sent although when translated into English it appears to be not only imperfect for the legitimate purpose in view but also to leave out certain necessary limitations, namely,

First, It appears to apply to all the inventions of Mr. Edison relating to the subjects named for all countries whereas it should have specifically named as I think the countries to which the agreement, relates.

Second, It provides that all these inventions shall be delivered without payment whereas those made during the twelve year period are to be paid for as provided in the agreement. It appears also that you are to have power to substitute other attorneys to exercise the whole or a part of the powers the rein conveyed to you. To this Mr. Edison would certainly have objection un-

[ATTACHMENT]

less the power itself should be re-drawn so as to insert the above and all other proper limitations upon the action of subsequent attorneys who will be unknown to him. While he might be willing to execute a paper giving very large powers to you, Mr. Porges or any one now known to him, he could not be expected to give the same to one of whom he does not now know.

The desire to do everything which will facilitate Mr. Porges is so great however that Mr. Edison executes and sends to you this power with express instructions however that before acting upon it in any way you will submit it to Mr. Moreau or such other legal adviser as you may have chosen for his advice whether it is in conformity to the agreement.

Mr. Porges will no doubt admit the propriety of this action and will also excuse you from making any substitution hereafter under this power without Mr. Edison's prior approval, and it is Mr. Edison's express instruction that you will not substitute any one in his place without first obtaining his approval.

I have added at the end a few words which may not have in French law the effect which I intend of making the two papers to be read together so that the agreement shall notify any one taking any benefit under the power of the limitations which ought to have been expressed in it.

The powers which have gone forward from both the company

[ATTACHMENT]

and Mr. Edison may be found sufficient and the accompanying one thereby rendered unnecessary. One other change should have been made in respect to the compensation to the Board of Directors. The real party in interest is the European Company and Mr. Edison ought not in a merely personal power of attorney to agree to or seem to authorize a scale of compensation which seems to him, at least liberal to the highest degree. But notwithstanding this Mr. Edison sends this paper forward, desiring you however to explain to M. M. Porges & Leon that he does not mean to express any opinion upon or to approve any particular scale of compensation for the Council of Administration. Whatever is suitable under the circumstances, or customary will be satisfactory to him.

As this Power of Attorney is for future use and probably is not immediately needed I suggest that you have a proper paper drawn by Mr. Moreau or Mr. Pouillet and after approval by Mr. Porges send it out to be executed to take the place of the present one.

Very Truly Yours,

G. P. Lowrey

1 cy Fr

Pardevant Me ... notaire à ...

A comparu :

Mr Edison

Lequel a, par ces présentes, donné pouvoir à Mr,

De pour lui et en son nom :

1° Faire tous apports à la Société actuellement en formation sous la dénomination de Compagnie Continentale Edison, ou sous telle autre dénomination qu'il conviendra à M. Sargent, fondateur de ladt Société, d'adopter ; apporter notamment à ladt Société, toutes les inventions de M. Edison, toutes celles qu'il pourra encore faire pendant cinq ans, et enfin toutes celles qui pourront être découvertes par lui pendant douze ans, à l'expiration des cinq années dont vient d'être parlé et ayant trait à la mesure à la distribution et à l'application des courants électriques, pour la production de la lumière électrique et de la force motrice.

Apporter, en conséquence, tous brevets, brevets de perfectionnement, certificats d'addition pris ou à prendre ; obliger le comparant à remettre tous lesdits brevets à la Société.

Faire ledit apport aux charges, clauses et conditions que le mandataire avisera ; stipuler notamment l'attribution à M. Edison, de 72% dans les bénéfices nets de la Société, après prélèvement sur les bénéfices de 5% pour la réserve légale, et de 15% pour le conseil d'administration.

Stipuler que ces 72% ne seront attribués qu'après le remboursement intégral du capital actions.

Approuver tous statuts ; signer tous actes déclaratifs d'apport des brevets, brevets de

perfectionnement et certificats d'addition.

2° Intervenir dans tous actes de fondation de la Société en formation, sous le titre de : Société Industrielle et manufacturière Edison, ou sous telle autre dénomination qu'il convendra à M. Porges de choisir ; signer tous statuts, — déclarations de souscription et de versement ; — stipuler toute attribution de parts dans les bénéfices à venir de la Société.

3° Intervenir dans tous actes de fondation de la Société en formation sous le titre de : Société Électrique Edison, ou sous telle autre dénomination qu'il convendra à M. Porges de choisir ; signer tous statuts, déclarations de souscription et de versement ; stipuler toute attribution de parts dans les bénéfices à venir de la société.

Aux effets ci-dessus, passer et signer tous actes, élire domicile, substituer dans tout ou partie des présents pouvoirs, et généralement faire le nécessaire.

Dont acte,

Witness to the signature of Thomas Alva Edison

Thomas A. Edison

CANCELLED, JAN 4 1882

CANCELLED, JAN 4 1882

S. S. Mann

Mary E. Meadowcroft

CANCELLED, JAN 4 1882

United States of America
State of New York
City and County of New York } ss:

On this 8th day of December, A. D. 1881, before me personally appeared Thomas Alva Edison, to me

known and known to me to be the person who executed the foregoing instrument and acknowledged to me that he executed the same for the uses and purposes therein set forth.

Witness my hand and official seal at said City of New York the day and year first mentioned.

Wm H. Meadowcroft
Notary public
New York County

CANCELLED
JAN 4 1882

Vu au Consulat Général de France à New-York pour légalisation de la signature apposée ci-dessus de M. Wm H. Meadowcroft, notaire public en cette ville. New-York le 10 Décembre 1881

Pour le Consul Général empêché
Le Chancelier
Le Consul suppléant
M Emy

New York
QUITTANCE
3
1881
JAN 12 1882

CANCELLED
JAN 4 1882

CONSULAT GÉNÉRAL DE LA RÉPUBLIQUE FRANÇAISE
NEW-YORK

Cancelled by me this 4th day of January 1882 by request of Thomas A. Edison

Wm H. Meadowcroft
Notary public
N.Y. Co.

(COPY)

Via Queenstown:

Grosvenor P. Lowrey, Esq.,

3 Broad St., New York.

Paris, January 6th, 1882.

Dear Sir:--

I wrote you the 19th of December, and enclose copy of the letter. (The above mentioned copy has been sent to you already about a week ago.)

I have got since yours of 19th and 23rd Dec., I must confess you that on the receipt of these letters I was in a very bad humour. That is the reason why I did not reply to you immediately. The reasons of my bad humour were the following:

(1) It was only according to your desire that I wrote to Mr. Edison himself. I confess, I was astonished not to get a <u>personal</u> answer from him. We in France are not accustomed to this mode of doing.

(2) Your cable told me that the powers I sent to you would be sent back by next steamer, and these powers

have not yet been sent forward today.

In order to spare considerable sums of expenses of --enregistrement--, it is absolutely necessary that the powers signed by Mr. Edison and the Light Company contain the words -- à apporter à une Société les brevets de Monsieur Edison-- because this term --à apporter-- is the only one which would exempt us from paying the duty upon the cession of the patents. Any other term: -- céder-- or -- transférer -- obliges us to make this payment.

Now you see what a considerable and precious time your friends make us lose by their hesitations. These hesitations can only be the effect of a want of confidence in myself and in Messrs. Batchelor and Bailey for whom the powers are destined.

(3) You first accepted the shares that I reserved for you; by your second telegram you refuse them. I was therefore obliged to refuse shares to many people that asked them and to offer them a fortnight later, which has produced a very bad effect.

I hope, dear Sir, that you will find the reasons for my bad humour sufficiently serious, and remain,

Yours truly,

Charles Porgès.

1882-01-09

CHAS. BATCHELOR
52, Rue de la Bruyère
CABLE ADDRESS
Batchelor. PARIS.

Paris, le Jan 9. 1882. 188

Mr. A. Edison Esq
65 5th Avenue
New York.

My dear Edison,

We have just started our Strasbourg plant and it is working nicely in the Gare or R.R. station there — The first night was eventful as usual; that is that although we had only on 35 lights after running 4 hours a man noticed fire coming out of armature at back side. I had Sudbel there and after he stopped he investigated it and found that ½ inch of a top layer and ½ inch of a bottom layer had burned right away and he had to patch in again so much — This was defective insulation between the two — Of course none knew anything about this but ourselves as it never stopped — I am very much afraid that they do not give these machines a 5 hours trial with a load on, or you would certainly see these defects, remembering the many nights I had to put in at the Opera House, doctoring them up, I always feel scared till I hear that they have run two or three days with a load on — Please make more rigorous trials.

Yours

Chas Batchelor

Do not have any trouble here
machines are run four hours
with 80 lights on for test
Strasbourg machine probably one of
the first ones made which were
defective

European Bureau
Sept 9-82
H. B. Allen

Exposition Internationale d'Electricité

LUMIÈRE ÉLECTRIQUE EDISON

PALAIS DE L'INDUSTRIE
Salles 24 & 25
DIRECTEURS
M.M. CHARLES BATCHELOR
OTTO A. MOSES

Paris, le January 9th 1882

Représentants de Mr EDISON
MM. Pushins & Bailey
33, Avenue de l'Opéra, 33

Thos A. Edison
65. 5th avenue New York

My dear Edison

I confirm my cable last night as follows — "Etercoside New York execute en French literally and without change no need recite patents cable me that this will be done" — I have this morning received Mr Lowery's letter and power and shall submit it to our counsel to morrow — Glad to hear Fabri has given the works a good order — I am using that to good advantage here I think with these fellows

Yours

Chas Batchelor

Sauté

via Queenstown

BANQUE CENTRALE
DU
COMMERCE & DE L'INDUSTRIE
SOCIÉTÉ ANONYME
Capital: 25 Millions de Francs

27, RUE DE LA CHAUSSÉE D'ANTIN.
Adresse pour Dépêches
CENTRALE COMMERCE PARIS

Paris, the 9th January 1882

Thomas A. Edison Esq.
President of the Edison Electric Light Company of Europe
(Limited)
65 5th Avenue
New-York.

Dear Sir,

Confirming our last of December 26th we beg to hand you herewith, according to the promise of Mr Charles Porgès, the list of subscribers of the three Electric Companies, and remain, dear Sir,

Yours respectfully

BANQUE CENTRALE
DU COMMERCE & DE L'INDUSTRIE
Charles Porgès S. Sawtinky

inclosure

[ENCLOSURE]

BANQUE CENTRALE
DU
COMMERCE & DE L'INDUSTRIE
SOCIÉTÉ ANONYME
Capital: 25 Millions de Francs

27, RUE DE LA CHAUSSÉE D'ANTIN.

Paris le 9 Janvier 1882

Liste des Actionnaires participants aux trois Sociétés Edison

Mrs M. & A. Cossizza
J. H. Ebors
S. Auspitz
J. Siegfried & Cie
E. de Neufville fils
J. de Neufville
Ed. Lebey
Agence Havas
Goldschmidt Rau & Cie
S. Jarislowsky
Georges Lebey
J. Camondo & Cie
Blanquet & Fourtou
Boyer
H. Bamberger
Banque Franco-Egyptienne
E. Cassel
H. de Parville
Jules Bapst
A. Grunebaum & Cie
A. Ebatard
Otto Ullmann
Ullmann & Una
A. J. Stern & Cie
Ernest May
Lévi-Crémieux
Ephrussi & Porges
Alex. Ellissen
Léon Goetz
M. Rikoff
Nissim Léon
Jac. Freund
Albert Lehmann
Alex. Cohen
A. Lange & S. Bentsch
Max. de Schnapper
Seligman Frères & Cie
Drexel Harjes & Cie
Morel Kahn
Jacob Landau
Lieben & Cie
Gustave Dreyfus
Lucien Dreyfus
Compagnie Intern. des Délégations
Camillo Roth
Banque d'Escompte de Paris
Leop. Fischl's Sohn
Georges Coronio
Rey
J. Grüninger
Jules Porges
Elie Cattani
P. Haarbleicher
Kohn Reinach & Cie
H. Oberndörffer
Pyane Varille
Ch. Berger
Léon de Roussen
Schever-Kestner
Lhuilier-Chevreux
Vicomte Lévavier
R. G. Lévy
J. E. Gunzburg
A. Pervier
F. de Rodays
Francis Magnard
Dr Ed. Meyer
Dr E. de Cyon
J. Richard
J. Billitzer
Cohn Burgers & Cie
Geb. S. & H. Reitzes
A. Joubert
G. Guéroult
Ch. Inshas
L. G. Coquelin
E. Caraglion
E. Alglave
Ch. Emard
W. Bouwens van der Boyen
A. Ruiz
D. Gerson
Ch. Mège
Charles Porges
Banque Centrale
V. Mac-Swiney
Dr Loewenberg
Simon Haas
Oscar Lener
Elie Léon
Chas. Batchelor
J. F. Bailey
Jules Lebaudy
Hélène Porges
Speyer Brothers
F. Szarvady

[ENCLOSURE]

Mis. Ch. Armengaud père	David Kunot	Louis Ran	Louis Cauba
Alex. Lange	E. Goldschmidt	Henry Pigache	E. Alfassa
Ch. Ad. Hurtz	J. Ulmo	Felix Martin	
Félix Abram	W. Zimmern	Victor Fournier	
Marquis de Pimmes	Mackiels Frères	Jean Favier	
Dr. Léon Labbé	Ernest Drena	Claude Magnin	
Dr. Jules Worms	Ernest Bonneau	Oscar Othon Siegel	
Baron Ebenh. de Hirsch	Vte E. Grünberg	R. Dulon Hessenbruch	
Jonas de Hirsch	H. B. Goldschmidt	H. Peter Herold	

CHAS. BATCHELOR
52, Rue de la Bruyère
CABLE ADDRESS
Batchelor. PARIS.

Paris, le Jan 20th 1888

Thos. A. Edison, Esq
65 5th Avenue
New York.

My dear Edison,

Your regulator idea is good and am glad to hear you are sending me one — You may be sure I shall take all precautions necessary for the bringing in of the model etc —

I have now opened an office or rather reshipping place at Hamburg and have got Force and another Young man there fitting it up — Hamburg is a free port — I shall send Force & Finlend very shortly to put up 5 plants there — Acheson is at present putting up a plant in Milan Italy and Luebel is doing good work in Germany — I have an order for lamps for Krupp's works at Essen and I am going to send Luebel there to put them on the machines as they want to use the machines they have been using for Arc lights — How about your arc-light? Is there anything new on it?

Yours
Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

1419

Grand Diplôme d'honneur
PARIS 1881

Ivry-sur-Seine, le 23rd January 1882.

Samuel Insull Esq.
65 Fifth Avenue
New York.

Dear Sir,

Let me thank you for trouble in giving cheque to Manning Freeman, as also for the promised Statement of my account in your letter of 5th inst.

The powers of attorney to act for me in the Edison Co. for isolated lighting shall go forward in a couple of days; very glad to see you are going to make a dividend.

Thanks for your letter of the 20th ult.; these informations are invaluable.

Yours faithfully,

Chas Batchelor

not seem with any one again. — We are getting straightened out here — hard think we will give good account of ourselves. You see details in letters to Mr. Eaton. We send to him as manager pro tempore. I suppose that is correct. With my best wishes for the newspaper.

Yours truly,

J. H. Bailey

Mr. Insull

27 Jany '82

My Dear Insull.

I have just been going over correspondence accumulated during my illness, and note specially your letter of Dec 19 referring to one of yours seen by Mr Lowrey. Your letters are never shown by us to any one except Batchelor, and the letter shown to Lowrey was shown on account of some statements about work in New York. I don't know which it was, though I remember distinctly showing not one but two or three; I considered him as in the family, you will understand, and I regret the contretemps which you may be assured will

File

Miscellaneous
14 Rue de Tilsitt
Paris, Jan 27.. 82

Moses

My dear Mr. Edison,

There are two matters which I have run across here, that it may be of use for you to own or control. Dion, whom you know, has offered to me all his patents in Europe and America on the continuous flat spiral. It strikes me it would be very useful for wrapping regulator field magnets, as the spiral could be turned off and more or less of it be thrown into circuit. Dion says he has an insulation for the flat spiral that is perfect, resisting heat. He has been engaged in testing it at Siemens' and Fontaines' and several others. Siemens (he says) is offering for it now. Anyhow if he will give me the refusal for America, you may make what use of it you please.

The other matter is a bi-sulphide of carbon engine which has just been put up in New York at Julius Johnson & Co. 118 St. near Harlem River. It is said to work well and economize 2/3 of the fuel. The inventor, Blumenberg, is here about instituting law suits against Prestas for damages for allowing patents to lapse; also for £5000. commissions, said to be due for negociating sale of a coal cutting machine. Perhaps Saporta might tell you about the inventor. Electrical matters are looking up here. Much arc lighting is proposed for the Champs Elysees, and already the great Place du Carrousel is well lit.

Incandescent lighting though is now greatly in favor, and your system will no doubt be as rapidly introduced as material can be supplied. The Strasbourg contract will set the ball in motion, although the Spanish affair maybe set back a little by the financial and political disturbances.

I will leave for home about the middle of February. If you have any commission to be attended to, telegraph them and I will defer my departure for the purpose.

Faithfully Yours
Otto H. Moses.

Exposition Internationale d'Electricité

PALAIS DE L'INDUSTRIE
Salles 24 & 25
DIRECTEURS
M.M. CHARLES BATCHELOR
OTTO A. MOSES

LUMIÈRE ÉLECTRIQUE EDISON

Paris, le 29 Janvier 1882

Représentants de Mr EDISON

MM. Puskas & Bailey

33, Avenue de l'Opéra, 33

A. Serm. Gr 32 Menimatre, 13

Monsieur Sigismund von Aleist
18 Grossbeeren Strasse S.W.
Berlin,

Monsieur,

Nous avons reçu vos deux honorées du 11 et 20 cte auxquelles nous réservons une réponse plus détaillée pour demain ou après demain au plus tard; mais nous ne pourrons guère vous faire un devis à moins d'avoir un plan de l'établissement à éclairer avec indication de la force motrice dont on peut disposer.

Veuillez agréer, Monsieur, nos salutations empressées,

Puskas & Bailey
Gy Dupont

1882-01-31

Thos A. Edison Esq
17 Feb 82

Paris January 31st 1882.

65 5th Avenue Newyork.

My dear Edison,

I confirm my cable of 25th as follows:- "No drawings of cutting moulds yet send quick both moulds if you can spare from lamp company to Hamburg I can get them in as models" I should like to know how soon I can expect these if you have to have them made ——— also cable 28th as follows:- "All lights out except Jablochkoff and Maxim who continue with machine in cellar final estimates under consideration send five plants and five thousand dollars worth of lamps wire sockets and sundries except chandeliers to Putkabailey Antwerp also ten assorted housewire Hamburg." As regards the lights at the Opera House I have been told that the principale men at the Grand Opera are interested in the Maxim and allowed them to move their machines into the cellar when we all left last December I think he has few there as I have had great difficulty in finding anybody that knew anything about it in the Opera house itself and only got the information from M Garnier the architect who said that M Vaucorbeil the director had requested that Maxim should stay longer — I think their lights are amongst the footlights — They are going to make a test in the public building

Private

here of all the different systems here and have asked us to join, the object is to see whether any electric light can be used instead of gas in the new Hotel de Ville (Town Hall) their proposition is good if carried out properly — They furnish the power, and they buy the lamps, putting them in themselves, and they want to use it till the New Town Hall is finished about 18 months — They hire the plant for that time —

I have heard today that there are 4 cases been waiting in Hamburg four days on Steamship "Frisia" for us and we have received no advices from you about it — Please have either myself or Puskas and Baily written to immediately anything is shipped and let us know what it is; as before I find out what this stuff is we shall have lost over a week and probably have to pay some expense — As I cabled you some days ago the factory at Jory is bought there were three men to buy it and rent it to us but the recent panic here "bust" one man and I suggested that the factory company took $\frac{1}{3}$ and the thing was settled — We get the buildings complete and two 40 H.P. engines and 3 boilers I am hard at work now in it —

Yours — Batchelor —

European Light

Jany 3 - 82

Bacchus

Please return

—EDISON ELECTRIC COMPANY.—

JOINT STOCK COMPANY. CAPITAL ONE MILLION FRANCS.

—BYELAWS.—

Received by Messrs Baudrier & Mégret,

Notaries, Paris, February 2nd 1882.

EDISON ELECTRIC COMPANY.

Joint Stock Company. Capital One Million Francs.

Byelaws.

Received by Messieurs Baudrier & Megrot, Notaries, Paris, February 2nd 1902.

— Part 1. —

Constitution and objects. Name, Seat and Duration of the Company.

Art. 1. A joint stock Company is hereby formed by the proprietors of the shares about to be hereafter created under the conditions imposed by the law of July 24th 1867.

Art. 2. The objects of the Company are:

The working and the granting of licenses to work the inventions of Mr. Edison by isolated installations either beyond the limits of towns, by sea or land, or in towns of 10,000 inhabitants or under, or even in towns of more than 10,000 inhabitants so long as a central station shall not be established in such towns of more than 10,000 inhabitants by the operating Edison Continental Company (Compagnie Continental Edison) of which the byelaws are this day set up by instrument executed in presence of

the undersigned notaries, which instrument though still unregistered will nevertheless be registered prior to these articles or simultaneously herewith.

Art. 3. The Company shall be called the Edison Electric Company, (Société Electrique Edison.)

Art. 4. The duration of this Company is fixed at 50 years from the date of its inauguration.

This period may, however, be extended by a decision of the general meeting in the manner hereinafter provided.

Art. 5. The seat of the Company shall be in Paris, and pro tem, 27 rue de la Chaussée d'Autin.

The offices of the Company may be removed to any other address in Paris simply by the decision of the Board of Administration.

— Part II. —

Capital Stock.

Art. 6. The Capital of the Company is fixed at One million of Francs, divided into 2000 shares of Five hundred francs each.

These 2000 shares are to be subscribed for, and shall be payable in cash; and this Company shall not be definitively constituted until after they shall all have been subscribed, and fully paid up, and until all other necessary legal formalities shall have been complied with.

Art. 7. The capital stock may be increased once or several times by decision of a general meeting of shareholders upon the motion of the Board.

The Board shall fix the conditions of the new issue of capital.

The privilege of subscribing for the new capital shall be reserved as follows:--

One fourth to the subscribers of the shares forming the original capital of the Company, or their assignees, in proportion to the amount of their subscriptions.

One fourth to the Board actually in office at the time of the increase of the capital stock in order to allow them to provide for the requirements of the service.

The Board shall however determine the way in which such fourth shall be placed.

And one half to the holders of the shares constituting the share capital at the time of each increase according to the number of shares held by each of them.

Such shareholders as shall not be entitled to one whole share may unite for the purpose of the exercise of their rights under such conditions as shall be imposed by the Board.

Art. 8. The Certificates of shares shall be taken from a counterfoil book, numbered in numerical succession, and signed by two Directors, or one Director and another person authorized by the Board.

In the interval prior to the delivery of certificates provisional receipts shall be issued to the subscribers of the shares.

The certificates of shares may be registered or to bearer at the option of the owner. Nevertheless by application of the 3rd Article of the law of the 24th July 1867, the General Meeting of shareholders must, in the first place, authorize delivery of the certificates to bearer.

The ownership of registered shares shall be identified by an entry in the Company's Registers and their transfer shall be carried out in conformity with Art. 36 of the Commercial Code by an entry of the transfer being made in the Company's books signed by the transferor and transferee or their respective agents acting under Power of Attorney and one of the Directors.

Transfers of certificates to bearer are made by simply handing over the certificate.

All charges arising from the transfer of shares shall be payable by the purchaser.

The Company may demand that the signature and capableness of the parties be certified by a government official.

Only shares upon which all due payments have been made shall be allowed to be transferred.

Art. 9. Each share gives the right of ownership in the Company's assets to an amount proportionate

to the number of shares issued, and shall participate in the profits of the Company in the proportion hereinafter set forth.

Art. 10. The liability of the shareholders shall be limited to the amount represented by their holding; beyond which no calls can be made.

Art. 11. Every share is indivisible, and the Company shall only recognize one holder for any ~~one~~ share. Joint holders of shares shall nominate one of their number to represent all.

The representatives or creditors of a shareholder cannot, under any circumstances, attach any property or securities of the Company, nor require of them the partition or sale at auction of any part therein; and they shall be bound to refer the matter to the Company's inventories and to the proceedings of the General Meetings of shareholders.

Art. 12. The dividends on all shares whether registered or to bearer shall be validly paid to the bearer of the share or of the coupon.

Art. 13. Any member who may have lost his certificate of ownership of a registered share in whatever way such loss may occur, may, upon proof of his ownership of the same and of loss of his certificate, obtain from the Company a duplicate certificate.

Such duplicate shall not be issued until six months after the extra-judicial notification to the Company, and the advertisement in a newspaper in the Department of the Seine authorized to publish legal notices, of the loss of the share certificate and the duplicate shall be untransferrable for 5 years dating from the publication above mentioned, and the interest and dividends shall not be payable until three years after the date of such insertion.

The untransferrableness of the share shall be marked upon the duplicate certificate.

Nevertheless the shareholder who may desire to sell his shares before the expiration of the period of five years as above provided shall be bound to furnish to the Company a guarantee equivalent to the value of the shares and dividends and interest calculated for the unexpired term upon the basis of the interest and dividends distributed during the three years preceding the loss of such share certificate.

With respect to shares to bearer all proceedings in regard thereto must be in conformity with the law of June 15th 1872.

Part 3.

Administration of the Company-Board.

Art. 14. The Company shall be administered by a Board consisting of at least Three members and not exceeding Ten.

The members of the Board shall be nominated by the General Meeting of shareholders except for the first three years as provided for by the 15th Article hereof.

The Board, even the first one, shall always have the power to fill all vacancies provisionally, subject to ratification by the next General Meeting of Shareholders.

Art. 15.

By derogation from the preceding article the first Board of Directors shall be composed of:

Messieurs Bailey.
Batchelor.
Georges Lebey.
Elie Léon.
Charles Porgès.
De Parville.
Le Viscomte Serrurier.
Chatard.

The terms of office of these statutory Directors shall extend over a period of three years, but they may be reëlected.

Art. 16.

At the expiration of the term of office of the statutory Directors the Directors shall be nominated for five years, subject, however, to rotation as follows:

The re-election of two members shall take place each year by lot during the four years immediately succeeding the first three. The eighth year should there by occasion, all the members not previously chosen, by lot, shall be subject by right to re-election . The rotation of members shall thenceforth take place according to seniority.

Every retiring member may be re-elected.

Every Director nominated to take the place of another shall remain in office only until the expiration of the period for which the Director whom he succeeds was elected.

Art. 17.

Each Director must hold 10 shares, and within 8 days of his nomination he must deposit in the Company's treasury the said shares, and they shall remain untransferrable during the term of his tenure of office, and shall be appropriated in conformity with Article 26 of the law of June 24th 1867 as a guarantee of his official acts.

The certificates of such shares shall be to bearer, and shall be stamped by a stamp indicating that they are untransferrable.

Art. 18.

Each year the Board shall choose from among its members a President, Vice President and Secretary; the latter, however, may be chosen from without the Board.

In case of the absence or inability of the President or Vice President, the Board shall nominate one of its members to fulfil the duties of President. The President and Vice President may always be re-elected.

Art. 19.

The Board shall meet at the offices of the Company so often as the interests of the Company shall require, and at least twice in each month; the presence of three members at the least being requisite to give validity to their proceedings.

But in this case the members actually present ~~shall~~ must be provided with the proxies of their colleagues, so that the votes given shall represent at least two thirds of the Board, such proportion of two thirds being necessary to render every decision of the Board valid.

Resolutions of the Board shall be adopted upon the vote of a majority of the members actually present or represented by proxy.

In case of an equality of votes, the President shall have the casting vote.

Any Director may delegate his powers to one of his colleagues; nevertheless a member of the Board cannot have more than two votes including his own.

In virtue of their standing as inventors Mr. Edison and the Light Company may always nominate a representative to represent them at all meetings of the Board, but only as a consultative member.

Art. 20.

The resolutions of the ~~Company~~ Board shall be verified by Minutes of the proceedings, signed by the President and another member, and copies or extracts of such proceedings to be produced in a Court of justice or elsewhere shall be signed by the President, or, in his absence, by a Director appointed for that purpose.

Art. 21.

The members of the Board shall receive fees for each attendance, the amount of which shall be fixed by the shareholders in ~~the~~ General Meeting.

Art. 22.

The Board of Directors is invested with ~~the~~ full powers for the administration and management of all the affairs of the Company.

It has especially the following powers, which are here enumerated; but not, however, as limitations of the powers of the Board.

It shall appoint and dismiss all agents or employes of the Company, fix the amount of their wages, emoluments or fees should occasion require.

It shall regulate and control the general expenses of the Administration, and shall provide for the employment of disposable funds.

It shall enact rules as to the operations forming the object of the Company.

In case of a new issue of capital it shall fix the date and regulate the mode of payment of the shares.

It may authorize the purchase or sale of patents or licenses.

It may authorize the purchase, sale or exchange, lease or renting of property required by the Company; it may accept mortgage securities and, if necessary, authorize the taking over of personal or real estate in partial or total payment of debts.

It may contract loans by way of opening of credits or otherwise, and give all kinds of securities even mortgage securities.

It may issue bills and negotiable instruments of all kinds.

It shall decide on behalf of the Company when necessary as to the institution or defence of all legal proceedings.

It may compound or compromise all proceedings to which the Company may be a party.

It shall receive all moneys due to the Company.

It may consent to all relinquishment of privileges, mortgages, cancellation of shares and other similar rights; give releases of all registrations of mortgages, distresses, attachments and other obstacles, with

or without payment of any of them.

It shall settle the balance sheets to be submitted to the General Meeting of shareholders, and recommend the amount of dividend to be distributed.

It shall call the General Meetings of shareholders; it may submit to the General Meetings any proposals for the notification of or addition to these byelaws, of increase or reduction of capital, as well as the prolongation, amalgamation, or dissolution of the Company.

Art. 23.

The Board may delegate all or part of its powers to one or several of its members, or to any Manager, or to an outside party, by special authority, for specific purposes, and for a limited period.

The Manager shall attend all meetings of the Board as a consultative member so often as desired by the Board.

Art. 24.

In conformity with Art. 32 of the Commercial Code, the members of the Board can not be held personally or severally liable for their official acts, and shall only be answerable for the fulfilment of their duties.

— Part IV. —

Commissioners.

Art. 25.

Each year at the General Meeting of shareholders there shall be nominated one or more commissioners—

shareholders or otherwise-- conformably with Art. 22 of the law of 24 July 1867.

Such Commissioner or Commissioners shall be entrusted with the duties of verification and supervision, and all other powers as defined by said law.

They shall be allowed a certain remuneration, the amount of which shall be fixed by the shareholders in General Meeting.

— Part V. —

General Meetings.

Art. 26. The General Meetings of shareholders regularly constituted shall represent all the shareholders.

The decisions of the General Meeting of Shareholders taken in conformity with law are binding upon all shareholders whether absent ot dissenting.

Art. 27.

A General Meeting of shareholders shall be held each year within the first six months thereof at the offices of the Company, or at such other place as may be decided upon by the Board.

An Extraordinary General Meeting may also be called by the Board, and, in case of urgency, by the Commissioner or Commissioners.

Notice of a general meeting of shareholders, or of an Extraordinary General Meeting, shall be given by the insertion of an advertisement in one of the Jour-

nals of the Department of the Seine authorized to publish legal notices, at least twenty days previous to the date of meeting.

Art. 28.

Ordinary General Meetings or Extraordinary General Meetings shall be composed of all shareholders who are owners for at least 15 days prior to the date fixed for the meeting of 10 shares upon which all due payments or calls have been paid.

Every shareholder holding ten shares or over may give his proxy to another member actually present at the meeting to represent him.

Art. 29.

The holders of shares to bearer must, in order to have the right to vote at General Meetings of shareholders, deposit their certificates at the offices of the Company fifteen days prior to the date of meeting.

In exchange therefor such shareholders shall receive a ticket of admission to the General Meeting which ticket shall be made out in the name of the shareholder personally.

Art. 30.

A General Meeting of Shareholders shall be held to be regularly constituted when a number of shareholders representing at least one-fourth of the total capital stock shall be present.

Art. 31.

In the event that upon a first call an ordinary general or extraordinary general meeting (except that provided for in Art. 36 hereof) should, by reason of the attendance of a less number than one-fourth of the shareholders, not be constituted, a second call shall be made within a period of eight days, and the interval between the call and the date of meeting shall, in such case, be reduced to 10 days.

The decisions arrived at by such second meeting shall be valid whatever may be the number of shareholders and shares represented; but such decisions can only relate to the business on the Agenda of the first meeting.

Art. 32. The Agenda shall be drawn up by the Board, and shall only contain such propositions as emanate from the Board, or such as may have been communicated to the Board at least ten days previous to the meeting under signature of shareholders holding together one-fourth of the capital stock.

Art. 33.

The General Meetings shall be presided over by the President of the Board, and, in case of inability on his part, or of his absence, by a Director named by the Board.

The two largest shareholders present shall be chosen as scrutineers.

The committee shall designate the Secretary.

Art. 34.

Resolutions of the meeting shall be carried by a majority of votes of the members present.

Each shareholder shall have one vote for each ten shares held by him, whether in his own right or as the representative of another, but in no case shall he have more than 20 votes.

Votes shall be subject to scrutiny upon the demand of at least 10 members.

Art. 35.

The Report of the Commissioners upon the position of the Company, and the balance sheet and accounts presented by the Directors shall be submitted to the Annual General Meeting of Shareholders.

The meeting shall examine the accounts and approve the same if necessary.

It shall fix the amount of dividend to be distributed.

It shall appoint Directors and Commissioners.

It shall deliberate and decide finally upon all interests of the Company, and may confer upon the Board such additional powers as in its opinion may be desirable.

Art. 36.

An Extraordinary General Meeting of Shareholders may, upon the recommendation of the Board, add to or mod-

ify the present byelaws in such manner as may seem to it to be beneficial.

It shall decide notably:-

1. The increase or reduction of capital, without however being able to reduce the same below its present amount.

2. The prolongation of the term of the Company or its sooner dissolution, but nevertheless such dissolution cannot be decreed except by reason of the loss of three-fourths of the capital stock.

3. The amalgamation of the Company with other companies, either actually existing, or to be created.

4. The bringing in or handing over of all the Company's assets, or of a part only of such assets, as well as the contracts of participation with other companies; for all of which purposes, however, General Meetings shall not be held to be constituted unless composed of a number of shareholders representing at least one-half of the share capital.

Art. 37.

The proceedings of the General Meeting of shareholders shall be entered in a special Minute Register, signed by the members of the Committee or a majority of them.

A list of attendance containing the names, addresses, and number of shares held by each of the members

constituting the meeting and certified by the Committee shall be annexed to the Minutes of the proceedings.

Art. 38.

Any copies or extracts of the proceedings of the Meeting required to be produced in a Court of Justice or elsewhere, shall be signed by the President of the Board of Directors, or, him failing, by a Director empowered to act in his stead.

— Part VI. —

Report. Inventory. Division of Profits.

Art. 39.

The financial year shall commence on January 1st and close December 31st.

By exception, the first year shall comprise the time from the date of the formation of the Company until December 31st 1892.

Art. 40.

The Board shall draw up each half year a short report as to the assets and liabilities of the Company.

Such report shall be put into the hands of the Commissioners within the period prescribed by law.

There shall also be made out every year in accordance with Art. 9 of the Commercial Code a balance sheet showing all the assets and liabilities of the Company in detail.

This inventory shall be submitted to the General Meeting of shareholders, and any shareholder may inspect the same beforehand at the offices of the Company, as well as the list of shareholders.

Art. 41.

The profits of the Company shall, in the first place, be appropriated to the payment of all expenses and debts of the Company of whatever nature or kind.

Art. 42.

The net returns after deduction of all charges constitute the profits of the Company.

From these profits there shall be deducted:

5 per cent. to constitute the legal reserve fund.

11 per cent. to the Board to be disposed of by it as it may deem proper.

So long as the share capital shall not have been entirely repaid, all surplus of profits shall be employed in the reimbursement of the said capital, in the manner and subject to the conditions imposed by the Board.

A Sinking Fund intended for the reimbursement of the said capital shall be formed for that purpose.

In exchange for shares thus redeemed, the holders shall receive certificates entitling them to receive dividends, which, however, shall only thenceforth entitle them to a proportionate share in the 40 per cent.

hereinafter assigned to the shareholders.

Upon re-payment of the said capital shares, the profits, always after deduction of the amounts above provided, shall be divided as follows:—

40 per cent. to the shareholders as dividend.

60 per cent. to Mr. Edison and the Light Company jointly, as founders subject to agreement between themselves.

And notwithstanding any increase of capital, these proportions shall remain invariable.

Art. 43.

The rights assigned by the preceding article to Mr. Edison and the Light Company shall be represented by share certificates of founders shares, which may be disposed of by them as agreed between them.

The number of these certificates shall be definitely determined by agreement between the Board and the Founders; but such share certificates shall not give the holders thereof the right to assist at the General Meetings of the Company.

The form of these certificates shall be decided by the Board alone.

These shares may be registered or to bearer, at the option of the holders.

They shall not confer any other

rights than those hereinabove mentioned, nor impose any obligation upon the holders thereof.

There shall be transferred by the simple handing over of the same if to bearer, and by transfer if registered.

The profits attaching thereto shall be paid to the bearers of the certificates.

The period within which the dividends may be claimed shall be limited to five years from the date on which they shall become payable.

Art. 44.

The payment of dividends shall take place in the year succeeding the close of that in which the profits were made, and at such times as may be fixed by the Board.

Nevertheless for the first half of each year the Board shall have the power of making a distribution on account of realized profits.

Art. 45.

All dividends remaining unclaimed for five years from the date on which they became payable shall be forfeited to the Company.

—Part VII.—

Dissolution. Liquidation.

Art. 46.

In the event of the loss of three-fourths of

the capital of the Company, the Directors shall be bound to call a General Meeting of the whole of the shareholders in order to decide upon the question of the desirability of the dissolution of the Company.

The Resolution of the Company in respect thereto must, in any case, be made public.

Art. 47.

At the expiration of the Company's Term of existence as hereby fixed, or in the event of its sooner dissolution, the shareholders in General Meeting shall decide upon the mode of liquidation, and shall appoint one or more liquidators.

The shareholders in General Meeting may confer such powers upon such liquidators as may in its judgment be necessary or desirable, — even that of bringing into, or ceding to another Company, or to a private individual, all the property and rights of the defunct Company.

The powers of the General Meeting of shareholders shall remain the same during the liquidation as during the existence of the Company.

In the event of any dissolution of the Company the liquidation shall be carried out, under charge of the Board then in office, unless otherwise decided by the General Meeting of shareholders, which shall decide finally upon the way in which such liquidation shall be effected.

The result of the liquidation after payment of the debts and of the share capital employed shall be appropriated as follows:

40 per cent. to the ordinary shareholders.

60 per cent. to the holders of founders shares.

Art. 48.

Any disputes which may arise during the lifetime of the Company, or at the time of the liquidation thereof, whether between shareholders and the Company, the Directors, or the Commissioners, or between shareholders themselves with respect to the Company's affairs, shall be dealt with according to law and submitted to the tribunals of the Department of the Seine. For this purpose any shareholder who does not reside in Paris shall choose an address there, in default of which his address shall be deemed to be the office of the Public Prosecutor attached to the Civil Court of First Instance of the Department of the Seine.

No action can be brought by a shareholder without having been first submitted to the last General Meeting of Shareholders.

—Part VIII.—

Provisional Arrangements.

Art. 49.

The two constitutive General Meetings, may by exception, be called by an advertisement inserted in a Journal of the Department of the Seine authorized to

publish legal notices as follows:

The first by three days notice, and

The second by eight days notice.

In case these meetings should not be attended by shareholders representing one-half of the capital stock of the Company, they shall only be considered as provisional, and further steps shall be taken as provided in the last paragraph of Art. 30 of the law of July 24th 1867.

Similarly by exception, the first Ordinary or Extraordinary General Meeting of this Company immediately following the constitutive meeting may be called in the like manner by eight days notice published in a Journal of the Department of the Seine authorized to publish legal notices. Such call may be made even prior to the formation of the Company.

Publication.

Art. 50.

In order to make public these byelaws, the Act of notifying the subscriptions and payments to the public, and the proceedings declaring the formation of the Company, full authority is given to the bearer to make a copy or abstract.

Paris, Feb'y 2nd 1882.

—EDISON CONTINENTAL COMPANY.—

(Compagnie Continentale Edison)

Joint Stock Company. Capital One million Francs.

—ARTICLES OF ASSOCIATION.—

Received by Messieurs Baudrier & Mégret,

Notaries, Paris. February 2,

1882.

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—Part I.—

Formation and Objects, Name, Seat and

Duration of the Company.

Art. 1. A Joint Stock Company is hereby formed by the proprietors of the shares which are to be created hereafter, under the conditions imposed by the law of July 24th 1867.

Art. 2. The object of the Company is:

1st: To secure the putting into profitable use of the patents already taken out or which may hereafter be taken out in the different European Countries hereinafter specified, for the inventions of Mr. Edison, for the measurement, distribution and application of electrical currents for the production of light, and the transmission of electro-motive power, and generally for the industrial and commercial working, even by the establishment of Agencies or branch Companies in the different

European Countries hereinafter mentioned of all patents or certificates of additions or improvements taken out or which may hereafter be taken out as specified in Article 6 in respect to the distribution of electrical currents, and the production of light by means of electricity or the transmission of motive power.

2nd: The sale of such patents and the granting of licenses; in short, the putting into profitable use in any form whatsoever of the said patents, but subject to the conditions herein stipulated.

Art. 3. The name of the Company shall be The Edison Continental Company.

Art. 4. The duration of the Company is fixed at 50 years from the date of its inauguration.

This period may, however, be prolonged by resolution of the general meeting of shareholders as hereinafter provided.

Art. 5. The offices of the Company are at 27 rue de la Chaussee d'Autin, Paris, but may be changed to anynothor address in Paris by resolution of the Board of Directors.

Part II.

Rights acquired by the Company.

Art. 6. Sect. 1. Messieurs Batchelor, Bailey and Puskas in the name of Mr. Edison and the Light Company jointly and severally bring to this Company,

without any guarantee except that of their existence, all patents already taken out for the inventions of Mr. Edison as well as for all apparatus to be used for electric lighting and also all patents for improvements and certificates of additions, and all patents for further inventions which may be taken out within five years reckoning from the date of the formation of the present Company; but only in the following countries:

1. France and the French Colonies.
2. Belgium.
3. Denmark.
4. Germany.
5. Austria and Hungary.
6. Russia.
7. Italy.
8. Spain (not including the Spanish Colonies)

The representatives of Mr. Edison and the Light Company expressly reserve for the benefit of their principals the patents already taken out or which may hereafter be taken out in the Kingdom of Great Britain, Ireland, Portugal, Sweden and Norway, for improvements in or additions to the inventions hereinabove mentioned.

Furthermore the representatives of Mr. Edison and the Light Company bind their principals for five years from the date of formation of the Company to provide the

latter with such specifications and drawings or models as may be necessary for taking out patents for all inventions or improvements in all European countries save those reserved as above, in so far as such inventions and improvements shall relate to the distribution of electrical currents and the production and transmission of electrical light and motive power, as provided in Art. 2.

And furthermore, at the expiration of the said five years the Representatives of Mr. Edison on his behalf undertake for a further period of twelve years, and without any other guarantee than that of their existence, to provide the Company with whatever may be requisite for the taking out of patents for inventions made by him during that time.

Mr. Edison shall offer to this Company the said patents for the same ends and within the same limits as the patents now existent; and in the event of Mr. Edison and the Company being unable to agree upon the remuneration to be made to Mr. Edison, the parties agree in honor to have the same determined by arbitration.

All these new patents whether for improvements or additions shall be taken out in the name of Mr. Edison; but in consideration of this acquisition the proprietary rights of the Company in these patents for improvements or additions shall be the same as the Company shall have in patents now existing.

All expenses which may be incurred in supplying specifications, drawings or models shall be borne by the Company, as well as all fees and expenses paid for the taking out of new patents from the date of the formation of the Company.

All patents already taken out and forming part of the present acquisition shall be delivered to the Company upon the definitive constitution of the Company.

These patents shall remain in the possession of the Company and shall be held at the disposal of Mr. Edison and the Light Company for obtaining information therefrom at any time either at the Company's office or upon giving a receipt for the same free of charge.

The representatives of Mr. Edison and the Light Company on behalf of their principals undertake to assist, when requested so to do, in the fulfilment of the necessary legal formalities to secure to the Company the right of ownership in patents for improvements and additions already taken out, or which may hereafter be taken out; and forming part of the said acquisition.

On their part the representatives of the Light Company prohibit that Company from working directly or indirectly Mr. Edison's inventions in so far as they refer to electric lighting and motive power in all European countries in which the laws do not allow of the issue of patents.

It is clearly understood that said patents in so far as they relate to any other objects than those above specified shall remain the exclusive property of Mr. Edison and the Light Company, and that this Company shall have exclusive ownership in these patents and inventions only in so far as they relate to the objects hereinabove specified.

Sect. 2.

In case the laws of a country other than France should not allow of divided ownership in patents in the manner above described, Mr. Edison and the Light Company shall transfer to this Company the exclusive right to the use of all these patents for the objects mentioned.

Sect. 3.

In all sales or conveyances of patents or of the rights attaching thereto the rights reserved by Mr. Edison and the Light Company shall be maintained.

The complete sale of one or several patents in any European Country, or the granting of a license for the whole of one of these countries, shall only be valid when expressly approved in writing by Mr. Edison and the Light Company.

Mr. Edison and the Light Company therefore reserve to themselves the right to accept or decline all arrangements desired to be carried out by the Company, and consequently, without such acceptance no agreement shall be valid, as above stated.

For this purpose Mr. Edison and the Light Company shall make known their acceptance or refusal either directly or through their duly accredited representatives in Paris within fifteen days of notification of the draft agreement which shall be made by this Company to Mr. Edison and the Light Company at the address chosen by them.

Such notification may be made simply by registered letter.

In case of Mr. Edison and the Light Company availing of the powers which they have reserved to themselves under this article should decline to sanction such an agreement they shall be bound to find a purchaser within three months of the date of such refusal upon more favorable terms than those proposed by the Company and to submit him to the approval of the Company.

In such case the shareholders of this Company shall continue to be entitled to 20 per cent. of the benefits arising from all agreements which may be made by Mr. Edison and the Light Company. If, on the contrary, Mr. Edison and the Light Company should fail to find a purchaser on more advantageous terms within the stipulated period of three months, the shareholders of this Company shall be entitled as to all agreements made by the Company for that purpose and as from the first agreement proposed by it to a further 5 per cent. of the benefits by way of fine to be paid by Mr. Edison and the Company in addition

to the 20 per cent. above stipulated.

The Company when assigning the said patents or any of them to other companies shall stipulate, unless the laws of the countries in which such other companies shall be formed should forbid, that at least one-third of the members of the Board of said concessionary companies shall be nominated by this Company, which undertakes in agreement with Mr. Edison and the Light Company to reserve to them the right of nominating at least one Director out of the third to be nominated by the Company.

In addition, the Company reserves to itself the right of controlling the purchasers of patents or licenses in order that the same may only be employed within the limits of their concessions.

Sect. 4.

Mr. Edison and the Light Company reserve to themselves the right of becoming parties with the Company or its assigns to any proceedings with respect to infringement of patents or any others relating to such patents, which the Company may consider necessary to institute or which may be instituted against it.

Sect. 5.

Messieurs Batchelor, Bailey and Puskas in the name of Mr. Edison and the Light Company stipulate for the benefit of their principals as inventors and proprietors of the patents ceded to the Company that they shall have

the personal and inalienable right to object to any amalgamation with other companies and to all accession or transfer of the Company's assets or part thereof or even to agreements of participation in profits or otherwise with other Companies.

Nevertheless this right will irrevocably cease from the date on which Mr. Edison and the Light Company shall themselves cease to nominally hold at least one-fifth of the 80 per cent. of the benefits assigned to them by Article 43 hereof.

Furthermore, from the date upon which Mr. Edison and the Light Company shall cease to be the nominal holders of at least one fifth of the 80 per cent. of the benefits assigned to them by Art. 43 hereof, they shall at the same time cease to have any rights under the conditions quoted in paragraph 3 of this article.

A person nominated by Mr. Edison and the Light Company as their representative may be present at all meetings of the Board of this Company, but only as a consultative member.

Messrs. Batchelor, Bailey and Puskas have at the same time submitted a statement to the undersigned notaries as to the condition of the French and foreign patents acquired by the Company, which statement drawn up upon a sheet of paper, stamped with a one franc 80 centime stamp, (being not yet registered but which shall be at the same time as these Articles) is hereto annexed, after having been cer-

tified as correct by Messrs. Batchelor, Bailey and Puskas, and after mention of its being so annexed was hereinabove made by the undersigned notaries.

As regards the French patents, a copy of their transfer to the Company shall be made at the Prefecture of the same immediately after the formation of the Company, and at its expense.

As regards the foreign patents, the Company itself shall carry out, immediately after its formation, all the necessary legal formalities to secure the completion of the transfer made to it by Mr. Edison and the Light Company.

As an equivalent hereinabove acquired by the Company, a portion of the benefits is assigned to Mr. Edison and the Light Company as mentioned in Article 43 hereof.

Part III.

Capital Stock.

Art. 7. The capital of the Company is fixed at 1,000,000 Francs, divided into 400 shares of 2,500 Francs each.

These 400 shares are to be subscribed for and shall be payable in cash; and this Company shall not be definitively constituted until after they shall all have been subscribed and fully paid, and until after all the other necessary legal formalities prescribed by law shall have been complied with.

No modification as to the number of shares or as to the nominal value shall take place within five years of the date of the formation of the Company, except as to the increase of capital hereinafter provided for, and that as an absolutely essential condition of these Articles.

Notwithstanding such prohibition the Company shall always, and at any time, have the right to increase its capital stock as stipulated in the following article.

Art. 8. The capital of the Company may be increased once or several times by resolution of the general meeting of shareholders upon the motion of the Board.

The Board shall fix the conditions of the new issues of capital.

The privilege of subscribing for the new capital shall be reserved as follows:

One-fourth to the subscribers of the shares forming the original capital of the Company, or their assignees, in proportion to the amount of their subscriptions.

One-fourth to the Board actually in office at the time of the increase of the capital stock, in order to allow the Directors to provide for the requirements of the service.

The Board shall determine the way in which such fourth shall be placed.

And one-half to the holders of the shares constituting the share capital at the time of each increase ac-

cording to the number of shares held by each of them.

Such shareholders as shall not be entitled to one whole share may unite for the purpose of the exercise of their rights under such conditions as shall be imposed by the Board.

Art. 9. The certificates of shares shall be detached from a counterfoil book, numbered in numerical succession, and signed by two Directors, or one director and another person authorized by the Board.

Pending the delivery of certificates, provisional receipts shall be issued to the subscribers of the shares.

The certificates of shares may be registered or to bearer at the option of the allottee.

The ownership of registered shares shall be identified by an entry in the company's Register.

Their transfer shall be effected in conformity with Art. 36 of the Commercial Code by an entry beingmade in the Company's books, signed by the transferrer and transferee or their respective agents acting under powers of attorney, and one of the Directors.

Transfers of certificates to bearer are made by simply handing over the certificate.

All charges arising from the transfer of shares shall be payable by the purchaser.

The Company may demand that the signature and

capableness of the parties may be certified by a government official.

Only shares upon which all due payments have been made shall be admitted to transfer.

Art. 10. Each share gives the right of ownership in the company's assets to an amount proportionate to the number of shares issued, and shall participate in the profits of the Company in the proportion hereinafter set forth.

Art. 11. The liability of the shareholders shall be limited to the amount represented by their holding; beyond which no calls can be made.

Art. 12. Every share is indivisible.

The Company shall only recognize one holder for any share. Joint holders of shares shall nominate one of their number to represent all.

The representatives or creditors of a shareholder cannot, under any circumstances, attach any property or security of the Company, nor demand of the Company the partition or sale at auction of any part therein; and they shall be bound to refer the matter to the Company's inventories and submit the same to the general meeting of shareholders.

Art. 13. The dividends on all shares, whether registered or to bearer, shall be legally payable to the bearer of the share or coupon.

Art. 14. Any member who may have lost his certificate of ownership of registered share in whatsoever way

such loss may occur, may, upon proof of his ownership of the same, and of loss of his certificate, obtain from the Company a duplicate certificate.

Such duplicate shall not be issued until six months after the extra-judicial notification of the loss of such certificate to the Company, and the advertisement in a newspaper in the Department of the Seine authorized to publish legal notices of the loss of the same.

The duplicate shall be untransferrable for five years, dating from the publication above mentioned, and the interest and dividends shall not be payable until three years after the date of such insertion.

The untransferrableness of the share shall be marked upon the duplicate certificate.

Nevertheless a shareholder who may desire to sell his shares before the expiration of the period of five years as above provided, shall be bound to furnish to the Company a guarantee equivalent to the value of the shares and dividends and interest calculated for the unexpired term upon the basis of the interest and dividends distributed during the three years preceding the loss of such share certificate.

With respect to shares to bearer, all proceedings in regard thereto must be in conformity with the law of June 15th 1872.

Part IV.

Administration of the Company. Board.

Art. 15. The Company shall be administered by a Board consisting of at least three members and not exceeding ten.

The members of the Board shall be nominated by the general meeting of shareholders except for the first three years as provided for by Art. 16 hereof.

The Board, even the first one, shall always have the power to fill all vacancies provisionally, subject to ratification by the next general meeting of shareholders.

Art. 16. By derogation from the preceding article, the first Board shall be composed of Messrs. Paskas Bailey, Batchelor, G. Lebey, Elie Leon, Magnin, Charles Porges Rau.

The duration of the term of office of these statutory directors shall be three years.

They may, however, be re-elected.

Art. 17. At the expiration of the term of office of the statutory directors, the directors shall be nominated for five years, subject, however, to rotation as follows:

The re-election of two members shall take place each year by lot during the four years immediately succeeding the first three.

The eighth year should there be occasion, all the members not previously chosen by lot shall then be compelled to retire.

The directors shall thencoforth be subject to rotation according to seniority.

Every retiring member may be re-elected.

Every director elected in place of another shall remain in office only until the expiration of the period for which the director whom he succeeds was elected.

Art. 18. Each director must be the holder of two shares. Within eight days of his nomination he must deposit the said shares in the Company's Treasury, and they shall remain untransferrable during the term of his tenure of office, and shall be appropriated in conformity with Art. 26 of the Law of June 24th 1967, as a guarantee of his official acts.

The certificates of such shares shall be to bearer and shall be stamped by a stamp indicating that they are untransferrable.

Art. 19. Each year the Board shall chose from among its members a President, Vice President and Secretary; the latter, however, may be chosen from without the Board.

In case of the absence or incapacity of the President or Vice President, the Board shall nominate one of its members to fulfil the duties of President.

The President and Vice President may always be re-elected.

Art. 20. The Board shall meet at the offices of the Company as often as the interests of the Company shall require, and at least twice a month.

The presence of at least three members shall be necessary to give the validity to their proceedings; but in this case the members actually present shall be provided with the proxies of their colleagues, so that the votes given shall represent at least two-thirds of the Board, such proportion of two-thirds being necessary to render any decision of the Board valid.

Resolutions of the Board shall be adopted upon the vote of the majority of the members actually present or represented by proxy; and in case of an equality of votes the President shall have the casting vote. Any director may delegate his powers to one of his colleagues; nevertheless a member of the Board cannot have more than two votes including his own.

Art. 21. The resolutions of the Board shall be verified by Minutes of the proceedings, signed by the President and another member, and copies or extracts of such resolutions required to be produced in a Court of Justice or elsewhere, shall be signed by the President or, in his absence, by a director appointed for that purpose.

Art. 22. The members of the Board shall receive fees for each attendance, the amount of which shall be fixed by the shareholders in general meeting.

Art. 23. The Board of Directors is invested with full powers for the administration and management of all the affairs of the Company. It has especially the following powers which are here enumerated, but not as limitations of the powers of the Board.

It shall appoint and dismiss all agents or employes of the Company, fix the amount of their wages, emoluments or fees should occasion require.

It shall regulate and control the general administration expenses and shall provide for the employment of disposable funds.

In case of new issues of capital, it shall fix the date and regulate the mode of payment of the shares.

It shall enact these rules as to the conduct of the general business of the Company.

It may authorize all purchasers or sales of patents and licenses.

It may authorize the purchase, sale or exchange leasing or renting of property required for the business of the Company; it may accept mortgage securities and, if need be, authorize the acquisition of personal or real estate in partial or total payment of debts.

It may contract loans by opening credits or otherwise, and may give all kinds of securities even mortgages.

It may issue bills and negotiable instruments

of all kinds.

It shall decide on behalf of the Company when necessary as to the institution or defence of legal proceedings, and may compound or compromise all proceedings affecting the interests of the Company, and shall receive all moneys due to the Company.

It may consent to all relinquishment of privileges, mortgages, forfeiture of shares and other similar rights; give releases of all entries of mortgage, distresses, attachments and other oppositions, with or without payment of any of them.

It shall settle the balance sheets to be submitted to the general meeting of shareholders and recommend the amount of dividend to be distributed.

It shall call the general meeting of shareholders and submit to it all propositions for the modification of or addition to these byelaws, or increase or reduction of capital, as well as for the prolongation, amalgamation or dissolution of the Company, and also all questions relative to contracts for division of profits.

It shall also decide upon all interests which may enter into the administration of the Company.

Art. 24. The Board may delegate all or part of its powers to one or several of its members, or to a Manager or outside party by special authority for specific purposes and for a limited period.

The Manager shall attend all meetings of the Board as a consultative member, so often as requested by the Board.

Art. 25. In conformity with Art. 32 of the Commercial Code, the members of the Board cannot be held personally or severally liable for their official acts, and shall only be answerable for the fulfilment of their duties.

Part V.

Commissioners.

Art. 26. Each year at the general meeting of shareholders there shall be nominated one or more commissioners, shareholders or otherwise, conformably with Art. 32 of the law of July 24th 1867.

Such Commissioner or Commissioners shall be entructed with the duties of verification and supervision and all other powers as defined by said law.

They shall be allowed a certain remuneration the amount of which shall be fixed by the shareholders in general meeting.

Part VI.

General Meetings.

Art. 27. The general meeting of shareholders regularly constituted shall represent all the shareholders.

The decisions of the general meeting of shareholders arived at in conformity with law are binding upon all shareholders whether absent or dissenting.

Art. 28. A general meeting of shareholders shall be held each year within the first six months thereof at the offices of the Company or at such other place as may be decided upon by the Board.

An extraordinary general meeting may also be called by the Board, and in case of urgency, by the Commissioner or Commissioners.

Notice of a general meeting or of an extraordinary general meeting of shareholders shall be given by advertisement in one of the law papers of the Department of the Seine, at least twenty days previous to the date of meeting.

Art. 29. Ordinary general meetings and extraordinary general meetings shall be composed of all shareholders holding two shares upon which all due payments or calls have been paid for at least fifteen days prior to the date fixed for the meeting.

Every shareholder holding two shares at the least may give his proxy to a shareholder actually present at the meeting to represent him.

Art. 30. The holder of shares to bearer in order to have the right to vote at general meetings of shareholders must leave their certificates at the offices of the Company fifteen days prior to the day of meeting.

In exchange therefor such shareholders shall receive a ticket of admission to the general meeting which ticket shall be made out in his name personally.

Art. 31. A general meeting of shareholders shall be held to be regularly constituted when a number of members representing at least one-fourth of the total capital stock shall be present.

Art. 32. In the event that upon the first call an ordinary general or extraordinary general meeting (except that provided for in Art. 37 hereof) should, by reason of the attendance of a less number than one-fourth of the shareholders, not be constituted, a second notice shall be given within a period of eight days and the date of meeting shall in such case, be reduced ten days.

The resolutions adopted by such second meeting shall be valid whatever may be the number of shareholders and shares represented; but such resolutions can relate only to the business on the agenda of the first meeting.

Art. 33. The agenda shall be drawn up by the Board, and shall only contain such propositions as emanate from the Board or have been communicated to it at least ten days previous to the meeting, under signature of shareholders representing one-fourth of the capital stock.

Art. 34. The general meetings of shareholders shall be presided over by the President of the Board, or in case of incapacity on his part, or absence, by a Director appointed by the Board.

The two largest shareholders present shall be called upon to fill the office of scrutineers.

The Committee shall nominate the Secretary of the meeting.

Art. 35. The resolutions of the meeting shall be carried by a majority of votes of the members present.

Each shareholder shall have one vote for each two shares held by him either in his own right or as the representative of another, but in no case shall he have more than twenty votes.

Votes shall be subject to scrutiny upon the demand of at least ten members.

Art. 36. The general meeting of shareholders shall have the report of the Commissioners upon the position of the Company, and the balance sheet and accounts presented by the directors submitted to it.

The meeting shall examine the accounts and approve the same if necessary.

It shall fix the amount of dividend to be distributed.

It shall appoint the directors and commissioners.

It shall deliberate and decide definitively upon all interests of the company, and may confer upon the Board such supplementary powers as shall be considered of utility.

Art. 37. An extraordinary general meeting of shareholders may upon the recommendation of the Board, make such additions or amendments to these articles as it may consider desirable.

It shall particularly decide as to:

1. The increase or reduction of capital.

Nevertheless no decrease of capital shall take place except by operation of the Sinking Fund from profits.

2. The prolongation of the life of the Company or its sooner dissolution.

Nevertheless such dissolution cannot take place except by reason of the loss of three-fourths of the capital stock.

3. The amalgamation of the Company with other companies either actually existing or to be formed.

4. The bringing in or handing over of all the Company's assets, or of a part only of such assets as well as contracts of participation with other companies.

For all decisions to be taken on the subject of the matters mentioned in Nos. 3 and 4 of this article, the general meeting of shareholders can only move in the matter subject to the conditions stipulated under paragraph 5 of Art. 6 hereof.

For all of the purposes mentioned herein (i.e. the present article) a general meeting shall not be held to be constituted unless composed of a number of shareholder-

ors representing at least one-half of the share capital.

Art. 38. The proceedings of the general meeting of shareholders shall be entered in a special minute register and signed by members of the committee or a majority of them.

A list of attendances containing the names, addresses, and number of shares held by each of the members constituting the meeting shall be certified by the committee and annexed to the Minutes of the proceedings.

Art. 39. Any copies or extracts of the proceedings of the meeting required to be produced in a Court of Justice or elsewhere shall be signed by the President of the Board of Directors, or, him failing by a director empowered to act in his stead.

— Part VII. —

Report. Inventory. Division of Profits.

Art. 40. The financial year shall commence on January 1st and December 31st shall end the same.

By exception, the first year shall comprise the time from the date of the formation of the Company until December 31st 1932.

Art. 41. The Board shall draw up each half year a short report of the assets and liabilities of the Company.

Such report shall be put into the hands of the Commissioners within the period prescribed by law.

There shall also be made out every year in conformity with Art. 9 of the Commercial Code a balance sheet showing all the assets and liabilities of the Company in detail.

This balance sheet shall be submitted to the general meeting of shareholders, and any shareholder may, prior to the meeting, inspect the same as well as the list of shareholders at the office of the Company.

Art. 42. The profits of the Company shall in the first place be applied to the payment of all expenses and debts of the Company of whatsoever kind.

Art. 43. The net returns after deduction of all charges, shall constitute the profits of the Company.

From these profits there shall be deducted five per cent. for the formation of the legal reserve fund.

Eleven per cent. for the Board to be applied as it may deem proper.

So long as the capital shares of the Company shall not be wholly repaid, all surplus of profits shall be appropriated to the payment of the said capital in the manner and under the conditions to be fixed by the Board.

For this purpose a Sinking Fund shall be created for repayment of said capital.

In exchange for shares so falling due, the shareholder shall receive a dividend bearing share which shall thenceforth only entitle him to a proportionate part of the

twenty per cent. hereafter assigned to the shareholders and the five per cent. eventually assigned by Art. 6.

After the re-payment of the said capital shares the net profits always after deduction of the amounts hereinabove stipulated shall be divided as follows:

Twenty per cent. to the shareholders as dividend and

Eighty per cent. to the Light Company and Mr. Edison in return for their assignment to be divided as they may mutually decide.

These proportions shall remain invariable whatever may be the increase of capital.

Art. 44. The rights assigned by the preceding article to Mr. Edison and the Light Company shall be represented by certificates of founders shares, which may be disposed of as they may think proper.

The number of these certificates shall be definitely determined by agreement between the Board and the founders. Such certificates shall not however give the holders thereof the right to be present at the general meetings of the company. The form of these certificates shall be decided upon by the Board alone.

These shares may be registered or to bearer at the option of the holders.

They shall not confer any other rights than those above mentioned nor impose on it any obligations upon their holders.

They shall be transferred by delivery if to bearer and by transfer if registered.

The profits attaching thereto shall be payable to the bearer of the certificates.

The period within which dividends may be claimed shall be limited to five years from the date on which the same shall become payable.

Art. 45. The payment of dividends shall take place in the year succeeding the close of that in which the profits were made, and at such times as may be fixed by the Board.

Nevertheless, for the first half year in each year, the Board shall have the power of making a distribution on account of the profits realized.

Art. 46. All dividends remaining unclaimed for five years from the date on which they became payable shall be forfeited to the Company.

Part VIII.

Dissolution. Liquidation.

Art. 47. The general meeting of shareholders may at any time decide to dissolve the Company upon the proposition of the Board and by a majority of three-fourths in the case stipulated by Art. 37 hereof.

In the event of the loss of three-fourths of the capital of the Company, the directors shall be bound to call a general meeting of all the shareholders in order to decide upon the question of the necessity of the dissolution of the Company.

The resolution of the Board in respect thereto must in any case be made public.

Art. 48. At the expiration of the Company's term of existence as hereby fixed, or in case of its sooner dissolution, the general meeting of shareholders shall decide upon the mode of liquidation and shall appoint one or more liquidators.

The general meeting may confer upon such liquidators all powers which it may consider necessary or desirable even that of bringing to or ceding to another company or to a private individual all the property and rights of the defunct company.

The powers of the general meeting of shareholders shall remain the same during the liquidation as during the existence of the company.

In the event of any dissolution of the Company, the liquidation shall be carried out, under charge of the Board then in office, unless otherwise decided by the general meeting of shareholders which shall decide finally upon the way in which such liquidation shall be effected.

The result of the liquidation after payment of the debts and of the share of capital employed shall be appropriated as follows:--

Twenty per cent. to the shareholders or their assigns and eighty per cent. to the holders of founders shares.

Art. 49. Any disputes which may arise during the lifetime of the Company or at the time of its liquidation, whether between shareholders of the Company, the directors or the commissioners, or between shareholders themselves with respect to the company's affairs, shall be dealt with according to law and submitted to the tribunals of the Department of the Seine. For this purpose any shareholder who does not reside in Paris shall chose an address there, in default of which his address shall be deemed to be the office of the public prosecutor attached to the Civil Court of first instance of the Department of the Seine.

No action can be brought by a shareholder without having been first submitted to the last general meeting.

Part IX.

Provisional Arrangements.

Art. 50. The two constitutive general meetings may, by exception, be called by an advertisement inserted in a Journal of the Department of the Seine, for the

publication of legal notices as follows:

The first by three days notice and

The second by eight days notice.

In case these meetings should not be attended by shareholders representing one-half of the capital stock, they shall only be considered as provisional, and further steps shall be taken as provided in the last paragraph of Art. 30 of the law of July 24th 1867.

Similarly by exception, the first general meeting, either ordinary or extraordinary, immediately following the constitutive meeting may be called in the like manner by eight days notice, published in a Law Journal of the Department of the Seine, and such call may be made even prior to the formation of the Company.

Publication.

Art. 51. In order to make public these by-laws, the act of notifying the subscriptions and payments to the public and the proceedings declaring the formation of the Company, full authority is given to the bearer to make a copy or abstract.

—EDISON MANUFACTURING COMPANY.—

(Société Industrielle & Commerciale Edison)

Joint Stock Company. Capital 1,500,000 Francs.

—ARTICLES OF ASSOCIATION.—

Drawn up according to authority received by Messrs.

Baudrier & Megrét, Notaries, Paris.

February 2nd, 1882.

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Part I.

Constitution and objects, Name, Seat and Duration of the Company.

Art. 1. A Joint Stock Company is hereby formed by the proprietors of the shares about to be hereafter created, under the provisions imposed by the Law of July 24th 1867.

Art. 2. The object of the Company is:

The manufacture of material and apparatus required for the working of the inventions of Mr. Edison and the improvements which may be made therein for the measurement, distribution and application of electrical currents for the production of light, and the transmission of electro-motive power.

Art. 3. The Company shall be called the Edison Manufacturing Company, (Société Industrielle et Commerciale Edison).

Art. 4. The life of the Company is limited to 50 years from the date of its inauguration.

This period may be extended by resolution of the general meeting of shareholders in the manner hereinafter provided.

Art. 5. The offices of the Company shall be in Paris and pro tem, 27 rue de la Chaussee d'Autin.

They may, however, be removed to any other address in Paris simply by resolution of the Board of Directors.

Part II.

Capital Stock.

Art. 6. The capital of the Company is fixed at One and a half million Francs divided into 3000 shares of Five hundred francs each.

These 3000 shares are to be subscribed for, and shall be payable in cash; and this Company shall not be definitively constituted until after they shall all have been subscribed, and fully paid up, and until all the other necessary formalities prescribed by law shall have been complied with.

Art. 7. The capital stock may be increased

once or several times by resolution of a general meeting of shareholders upon the motion of the Board.

The Board shall fix the conditions of the new issues of capital.

The privilege of subscribing for the new capital shall be reserved as follows:--

One-fourth to the subscribers of the shares forming the original capital of the Company, or their assignees, in proportion to the amount of their subscriptions.

One-fourth to the Board actually in office at the time of the increase of the capital stock in order to allow the Directors to provide for the requirements of the service. The Board shall determine the way in which such fourth shall be placed.

And one-half to the holders of the shares constituting the share capital at the time of each increase according to the number of shares held by each of them.

Such shareholders as shall not be entitled to one whole share may unite for the purpose of the exercise of their rights under such conditions as shall be imposed by the Board.

Art. 8. The Certificates of shares shall be detached from a counterfoil book, numbered in numerical succession, and signed by two Directors, or one Director and another person authorized by the Board.

Pending the delivery of certificates, provisional receipts shall be issued to the subscribers of the shares.

The certificates of shares may be registered or to bearer at the option of the allottee. Nevertheless by application of the 3rd Article of the Law of the 24th July 1867, the general meeting of shareholders must, in the first place, authorize delivery of the certificates to bearer.

The ownership of registered shares shall be identified by an entry in the Company's Register.

Their transfer shall be effected in conformity with Art. 36 of the Commercial Code, by an entry being made in the Company's books signed by the transferror and transferee or their respective agents acting under Powers of Attorney, and one of the Directors.

Transfers of certificates to bearer are made by simply handing over the certificate. All charges arising from the transfer of shares shall be chargeable to the purchaser. The Company may demand that the signature and capableness of the parties be certified by a government official.

Only shares upon which all due payments have been made shall be admitted to transfer.

Art. 9. Each share gives the right of owner-

ship in the Company's assets to an amount proportionate to the number of shares issued, and shall participate in the profits of the Company in the proportion hereinafter set forth.

Art. 10. The liability of the shareholders shall be limited to the amount represented by their holding; beyond which no calls can be made.

Art. 11. Every share is indivisible.

The Company shall only recognize one holder for any ~~one~~ share. Joint holders of shares shall nominate one of their number to represent all.

The representatives or creditors of a shareholder cannot, under any circumstances, attach any property or securities of the Company, nor demand of the Company the partition or sale at auction of any part therein; and they shall be bound to refer the matter to the Company's inventories and submit the same to the General Meetings of shareholders.

Art. 12. The dividends on all shares, whether registered or to bearer, shall be legally payable to the bearer of the share or coupon.

Art. 13. Any member who may have lost his certificate of ownership of a registered share in whatever way such loss may occur, may, upon proof of his ownership of the same and of loss of his certificate, obtain from the Company a duplicate certificate.

Such duplicate shall not be issued until six months after the extra-judicial notification of the loss of such certificate to the Company, and the advertisement in a newspaper in the Department of the Seine authorized to publish legal notices, of the loss of the same.

The duplicate shall be untransferrable for 5 years dating from the publication above mentioned, and the interest and dividends shall not be payable until three years after the date of such insertion.

The untransferrableness of the share shall be marked upon the duplicate certificate.

Nevertheless the shareholder who may desire to sell his shares before the expiration of the period of five years as above provided, shall be bound to furnish to the Company a guarantee equivalent to the value of the shares and dividends and interest calculated for the unexpired term upon the basis of the interest and dividends distributed during the three years preceding the loss of such share certificate.

With respect to shares to bearer, all proceedings in regard thereto must be in conformity with the law of June 15th 1872.

Art. 14. There shall be created under the provisions of Art. 43 hereof, a special sinking fund for the redemption of the capital shares of the Company.

The general meeting of shareholders upon the recommendation of the Board shall fix the period at which such redemption shall commence and the conditions under which it shall take place.

Shares thus falling due shall be entitled:--

1st: To the re-payment of the amount paid thereon.

2nd: To interest at the rate of 6 per cent. for the past year if the profits have allowed of such a distribution.

3rd: To a dividend bearing share having the same rights attaching thereto as the unredeemed shares, except the proportion of dividend representing interest.

Part III.

Administration of the Company. Board.

Art. 15. The Company shall be administered by a Board consisting of at least three members and not exceeding ten.

The members of the Board shall be nominated by the general meeting of shareholders except for the first three years as provided for by the 15th Article hereof.

The Board, even the first one, shall always have the power to fill all vacancies provisionally, subject to ratification by the next general meeting of shareholders.

Art. 16. By derogation from the preceding

article the first Board of Directors shall be composed of,

Messrs.

Batchelor.

Chatard.

Favier.

Fournier.

Elie Léon.

Charles Porgès.

Puskas.

The duration of the term of office of these statutory Directors shall be three years.

They may, however, be re-elected.

Art. 17. At the expiration of the term of office of the statutory Directors, the Directors shall be nominated for five years subject, however, to rotation as follows:—

The re-election of two members shall take place each year by lot during the four years immediately succeeding the first three. The eighth year should there be occasion, all the members not previously chosen by lot shall then be compelled to retire. The Directors shall thenceforth be subject to rotation according to seniority.

Every retiring member may be re-elected.

Every Director elected in place of another shall remain in office only until the expiration of the period for which the Director whom he succeeds was elected.

Art. 18. Each Director must hold 10 shares; and within 8 days of his nomination he must deposit the said shares in the Company's Treasury, and they shall remain untransferrable throughout the term of his tenure of office, and shall be appropriated in conformity with Article 26 of the Law of June 24th 1867 as a guarantee of his official acts. The certificates of such shares shall be to bearer and shall be stamped by a stamp indicating that they are untransferrable.

Art. 19. Each year the Board shall choose from among its members a President, Vice President and Secretary; the latter, however, may be chosen from without the Board.

In case of the absence or inability of the President or Vice President, the Board shall nominate one of its members to fulfil the duties of President. The President and Vice President may always be re-elected.

Art. 20. The Board shall meet at the offices of the Company as often as the interests of the Company shall require, and at least twice a month.

The presence of at least three members shall be necessary to give validity to their proceedings; but in this case the members actually present shall be provided with the proxies of their colleagues, so that the votes given shall represent at least two thirds of the Board, such proportion of two-thirds being necessary to render any decision of the Board valid.

Resolutions of the Board shall be adopted upon the vote of a majority of the members actually present or represented by proxy.

In case of an equality of votes, the President shall have a casting vote.

Any Director may delegate his powers to one of his colleagues; nevertheless a member of the Board cannot have more than two votes including his own.

In virtue of their standing as inventors, Mr. Edison and the Light Company may always nominate a representative to attend at all meetings of the Board, but as a consultative member only.

Art. 21. The resolutions of the Board shall be verified by Minutes of the proceedings signed by the President and another member, and copies or extracts of such proceedings required to be produced in a Court of Justice or elsewhere shall be signed by the President, or, in his absence, by a Director appointed for that purpose.

Art. 22. The members of the Board shall receive fees for each attendance the amount of which shall be fixed by the shareholders in general meeting.

Art. 23. The Board of Directors is invested with full powers for the administration and management of all the affairs of the Company.

It has especially the following powers which are here enumerated; but not as limitations of the powers

of the Board.

It shall appoint and dismiss all agents or employés of the Company, fix the amount of their wages, emoluments or fees should occasion require.

In case of a new issue of capital, it shall fix the date and regulate the mode of payment of the shares.

It shall regulate and control the general administration ..... expenses, and shall provide for the employment of disposable funds.

It shall enact rules as to the conduct of the general business of the Company.

It may authorize the purchase, sale or exchange, leasing or renting of property required for the business of the Company; it may accept mortgage securities and, if necessary, authorize the acquisition of personal or real estate in partial or total payment of debts.

It may contract loans by opening credits or otherwise, and give all kinds of securities even mortgage debentures.

It may issue bills and negotiable instruments of all kinds.

It shall decide on behalf of the Company when necessary as to the institution or defence of legal proceedings, and may compound or compromise all proceedings affecting the interests of the Company.

It shall receive all moneys due to the Company.

It may consent to all relinquishment of privileges, mortgages, forfeiture of shares and other similar rights; give releases of all entries of mortgage, seizures, attachments and other oppositions, with or without payment of any of them.

It shall settle the balance sheets to be submitted to the general meeting of shareholders and recommend the amount of dividend to be distributed.

It shall call the General Meeting of shareholders.

It shall submit to the General Meetings all proposals for the modification of or addition to these byelaws, or increase or reduction of capital, as well as for the prolongation, amalgamation, or dissolution of the Company. It shall also decide upon all interests which may enter into the administration of the Company.

Art. 24. The Board may delegate all or any part of its powers to one or several of its members or to a Manager or to an outside party, by special authority for specific purposes and for a limited period.

The Manager shall attend all meetings of the Board as a consultative member so often as requested by the Board.

It is also agreed that upon request of the Board Mr. Edison shall nominate a Manager subject to its

approval.

Art. 25. In conformity with Art. 32 of the Commercial Code the members of the Board can not be held personally or severally liable for their official acts, and shall only be answerable for the discharge of their duties.

— Part IV. —

Commissioners.

Art. 26. Each year at the general meeting of shareholders there shall be nominated one or more commissioners-- shareholders or otherwise-- conformably with Art. 32 of the law of 24th July 1867.

Such Commissioner or Commissioners shall be entrusted with the duties of verification and supervision, and all other powers as defined by said law.

They shall be allowed a certain remuneration, the amount of which shall be fixed by the shareholders in general meeting.

—Part V.—

General Meetings.

Art. 27. The general meeting of shareholders regularly constituted shall represent all the shareholders.

The decisions of the general meeting of shareholders taken in conformity with law are binding upon all shareholders whether absent or dissenting.

Art. 28. A general meeting of shareholders

shall be held each year within the first six months thereof at the offices of the Company, or at such other place as may be decided upon by the Board.

An extraordinary general meeting may also be called by the Board, and, in case of urgency, by the Commissioner or Commissioners.

Notice of a general meeting or of an extraordinary general meeting of shareholders shall be given by the insertion of an advertisement in one of the Journals of the Department of the Seine, authorized to publish legal notices, at least twenty days previous to the date of meeting.

Art. 29. Ordinary general meetings or extraordinary general meetings shall be composed of all shareholders who are the holders of 10 shares, upon which all due payments or calls have been paid, for at least 15 days prior to the date fixed for the meeting.

Every shareholder holding ten shares or over may give his proxy to another member actually present at the meeting to represent him.

Art. 30. The holders of shares to bearer must, in order to have the right to vote at general meetings of shareholders, deposit their certificates at the offices of the Company fifteen days prior to the date of meeting.

In exchange therefor such shareholders shall receive a ticket of admission to the general meeting, which ticket shall be made out in the name of the shareholder personally.

Art. 31. A general meeting of shareholders shall be held to be regularly constituted when a number of shareholders representing at least one-fourth of the total capital stock shall be present.

Art. 32. In the event that upon a first call an ordinary general or extraordinary general meeting (except that provided for in Art. 37 hereof) should, by reason of the attendance of a less number than one-fourth of the shareholders, not be constituted, a second notice shall be given within a period of eight days, and the interval between issuing the notice and the date of meeting shall, in such case, be reduced to ten days.

The decisions arrived at by such second meeting shall be valid whatever may be the number of shareholders and shares represented; but such decisions can only relate to the business on the agenda of the first meeting.

Art. 33. The agenda shall be drawn up by the Board, and shall only contain such propositions as emanate from the Board or have been communicated to it at least ten days previous to the meeting, under signature

of shareholders holding together one-fourth of the capital stock.

Art. 34. The general meetings shall be presided over by the President of the Board, and, in case of inability on his part, or of his absence, by a Director appointed by the Board.

The two largest shareholders present shall be chosen scrutineers.

The committee shall nominate the Secretary of the meeting.

Art. 35. Resolutions of the meeting shall be carried by a majority of votes of the members present.

Each shareholder shall have one vote for each ten shares held by him either in his own right or as the representative of another, but in no case shall he have more than twenty votes.

Votes shall be subject to scrutiny upon the demand of at least 10 members.

Art. 36. The Report of the Commissioners upon the position of the Company, and the balance sheet and accounts presented by the Directors shall be submitted to the Annual General Meeting of shareholders.

The meeting shall examine the accounts, and approve the same if necessary.

It shall fix the amount of dividend to be distributed.

It shall appoint the Directors and Commissioners.

It shall deliberate and decide finally upon all interests of the Company, and may confer upon the Board such additional powers as in its opinion may be desirable.

Art. 37. An Extraordinary General Meeting of shareholders may upon the recommendation of the Board make such additions or amendments to these articles as it may consider desirable.

It shall particularly decide as to:

1. The increase or reduction of capital, without however being able to reduce the same below its present amount.

2. The prolongation of the life of the Company or its sooner dissolution, but nevertheless such dissolution cannot be decreed except by reason of the loss of three-fourths of the capital stock.

3. The amalgamation of the Company with other companies either actually existing or to be formed.

4. The bringing in or handing over of all the Company's assets, or of a part only of such assets, as well as the contracts of participation with other companies: for all of which purposes, however, a general meeting shall not be held to be constituted unless composed of a number of shareholders representing at least one-half of the share capital.

Art. 38. The proceedings of the general meeting of shareholders shall be entered in a special minute register, signed by the members of the committee or a majority of them.

A list of attendance containing the names, addresses and number of shares held by each of the members constituting the meeting shall be certified by the Committee and annexed to the minutes of the proceedings.

Art. 39. Any copies or extracts of the proceedings of the meeting required to be produced in a Court of Justice or elsewhere shall be signed by the President of the Board of Directors, or, him failing, by a Director empowered to act in his stead.

—Part VI.—

Report. Inventory. Division of Profits.

Art. 40. The financial year shall commence on January 1st and close December 31st.

By exception, the first year shall comprise the time from the date of the formation of the Company until December 31st 1882.

Art. 41. The Board shall draw up each half year a short report of the assets and liabilities of the Company.

Such report shall be put into the hands of the Commissioners within the period prescribed by law.

There shall also be made out every year in accordance with Art. 9 of the Commercial Code a balance sheet showing all the assets and liabilities of the Company in detail.

This balance sheet shall be submitted to the General Meeting of shareholders and any shareholder may, prior to the meeting, inspect the same as well as the list of shareholders at the offices of the Company.

Art. 42. The profits of the Company shall in the first place be applied to the payment of all expenses and debts of the Company of any kind whatsoever.

Art. 43. The net returns after deduction of all charges shall constitute the profits of the Company.

From these profits there shall be deducted:

1st: 5 per cent. to constitute the legal reserve fund:

2nd: A sum equal to 6 per cent. for interest upon the paid up share capital which shall be distributed among the shareholders as a first dividend.

3rd: 11 per cent. to the Board to be applied as it may deem proper.

4th: 12 per cent. to be applied to the formation of a sinking fund as provided in Art. 14 hereof.

Of the remainder 50 per cent. shall be assigned to the shareholders as dividend and 50 per cent. to

Mr. Edison and the Light Company jointly as Founders, to be applied as they may mutually decide; and notwithstanding any increase of capital, these proportions shall remain invariable.

Art. 44. The rights assigned by the preceding article to Mr. Edison and the Light Company shall be represented by certificates of founders shares, which may be disposed of by them as agreed between them.

The number of these certificates shall be definitely determined by agreement between the Board and the Founders; but such share certificates shall not give the holders thereof the right to assist at the general meetings of the Company.

The form of these certificates shall be decided by the Board alone.

These shares may be registered or to bearer at the option of the holders.

They shall not confer any other rights than those hereinabove mentioned nor impose any obligation upon their holders.

They shall be transferred by delivery if to bearer, and by transfer if registered.

The profits attaching thereto shall be paid to the bearer of certificates.

The period within which dividends may be claimed shall be limited to five years from the date on which the same shall become payable.

Art. 45. In the event of the profits of any one year being insufficient to pay a dividend or interest of 6 per cent. upon each share, the deficiency may be made up from the Reserve Fund, if the latter should exceed in amount one-tenth of the Capital.

Art. 46. The payment of dividends shall take place in the year succeeding the close of that in which the profits were made, and at such times as may be fixed by the Board.

Nevertheless for the first half of each year the Board shall have the power of making a distribution on account of the profits realized.

Art. 47. All interest or dividends remaining unclaimed over five years from the date on which they became payable shall be forfeited to the Company.

—Part VII.—

Dissolution. Liquidation.

Art. 48. In the event of the loss of three-fourths of the capital of the Company the Directors shall be bound to call a general meeting of all the shareholders in order to decide upon the question of the desirability of dissolving the Company.

The resolution of the Company in respect thereto must in any case be made public.

Art. 49. At the expiration of the Company's term of existence as hereby fixed, or in case of its sooner

dissolution the general meeting of shareholders shall decide upon the mode of liquidation and shall appoint one or more liquidators.

The shareholders in general meeting may confer upon such liquidators all powers which it may consider necessary or desirable, even that of bringing into or ceding to another Company or to a private individual all the property and rights of the defunct Company.

The powers of the general meeting of shareholders shall remain the same during the liquidation as during the existence of the Company.

In the event of any dissolution of the Company, the liquidation shall be carried out, under charge of the Board then in office, unless otherwise decided by the general meeting of shareholders which shall decide finally upon the way in which such liquidation shall be effected.

The result of the liquidation after payment of the debts and of the share capital employed shall be appropriated as follows:--

50 per cent. to the ordinary shareholders.

50 per cent. to the holders of founders shares.

Art. 50. Any disputes which may arise during the lifetime of the Company, or at the time of the liquidation thereof, whether between shareholders and the Company, the Directors or the Commissioners, or between shareholders

themselves with respect to the Company's affairs, shall be dealt with according to law and submitted to the tribunals of the Department of the Seine. For this purpose any shareholder who does not reside in Paris shall choose an address there, in default of which his address shall be deemed to be the office of the Public Prosecutor ~~near~~ attached to the Civil Court of First Instance of the Department of the Seine.

No action can be brought by a shareholder without having been first submitted to the last General Meeting of Shareholders.

— Part VIII. —

Provisional Arrangements.

Art. 51. The two constitutive general meetings may, by exception, be called by an advertisement inserted in a Journal of the Department of the Seine, authorized to publish legal notices, as follows:--

The first by three days notice, and

The second by eight days notice.

In case these meetings should not be attended by shareholders representing one-half of the capital stock of the Company, they shall only be considered as provisional, and further steps shall be taken as provided in the last paragraph of Art. 30 of the law of July 24th 1867.

Similarly by exception, the first General Meeting, either ordinary or extraordinary, of this Company immediately following the constitutive meeting may be called in the like manner by eight days notice, published in

a journal of the Department of the Seine authorized to publish legal notices. Such call may be made even prior to the formation of the Company.

Publication.

Art. 52. In order to make public these byelaws, the act of notifying the subscriptions and payments to the public and the proceedings declaring the formation of the Company, full authority is given to the bearer to make a copy or abstract.

Paris, February 2nd 1882.

Answd

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Ivry-sur-Seine. le 7 Février 1882.

Thos A Edison Esq
65 5th Avenue
New York.

My dear Edison.

The plants you sent to Hamburg have gone to different parts of Russia — I had a lot of extras sent on there previous to their going — I now find out for the first time that you have sent us a new socket and also a new piece on the lamps — It would be well and save a great deal of expense if you would enforce a rule there of letting us know when you send anything different from the ordinary — The first intimation of this change I get from Finland from parties who wish to return the lamps that I sent from Paris as they dont fit

Yours
Batchelor

[TRANSLATION FOLLOWS]

BANQUE CENTRALE
DU
COMMERCE & DE L'INDUSTRIE
SOCIÉTÉ ANONYME
Capital: 25 Millions de Francs

27, RUE DE LA CHAUSSÉE D'ANTIN.

Paris le 8 Janvier 1882

via Queenstown

Copie

Edison Manufacturing Company
New-York.
65.-5th Avenue

Messieurs

En nous référant à la circulaire incluse, nous vous prions de vouloir bien prendre bonne note que pour tous les ordres d'expédition qui vous seront donnés par la "Société Electrique Edison" de notre ville, vous pouvez tirer, pour notre compte, soit à trois jours de vue, soit à soixante jours de date, sur Mrs Speyer Brothers, 1. Angel Court E.C. à Londres chez lesquels vous êtes accrédités.

La Société Electrique n'aura donc pas besoin d'ajouter cette indication à ses dépêches. Mais il est indispensable que le jour même où vous pourriez sur Londres, vous nous en avisiez nous-mêmes par lettre, parce qu'autrement Mrs Speyer Brothers n'en seraient pas informés en temps opportun. — Nous vous prions, en outre, de bien vouloir nous indiquer toujours dans vos lettres d'avis le nom des maisons

[TRANSLATION FOLLOWS]

à l'ordre desquelles vous aurez émis vos traites

Veuillez bien nous accuser réception de la présente et agréez, Messieurs, nos salutations distinguées.

BANQUE CENTRALE
DU COMMERCE & DE L'INDUSTRIE

Signé: S. Jaroslowsky. E. Reville

Fruchi & Cie
Feb. 9. 82
Paris Banks

[TRANSLATION]

Messrs Edison Mfg Co

We refer you to the circular enclosed you requesting you to note that for all orders filled by you for the Edison Electric Co of Paris you may draw at 3 days sight or at 60 days after date on Messrs Speyer Bros Angel Court E.C. London who will honor your drafts

It will not be necessary for the Electric Company to repeat these instructions, but it is indispensable that ~~any draft~~ it should be advised by letter on the same day on which a draft is drawn otherwise Messrs Speyer Bro will not be informed in time. You will also please advise us at same time in whose favor drafts are drawn

[ATTACHMENT]

~~Have~~ I duly received your favor of 8th inst and note your instructions contained therein I have today drawn off Speyers Bros in favour of Brown Morgan & Co for £1430.17.0 being $7000 at exchange $4.86½.

~~I usually draw these drafts & I do drawing~~ on Speyers Bros to the charge to the Account of ~~chang~~ Charles Forges as I receive instructions from Paris to do so. Some time back please inform me as to whether I shall continue to draw in this manner or if not shall I draw them on Speyers Bros as against your account

European Lights

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Feb. 10

File.

Batchelor

IVRY-sur-Seine, le 10 Février 1882

My dear Edison —

Your numerous letters and bills to hand last night also your cable — "Cable quickly authority drew". We have got £4000 put to your credit to day and Mr Bailey called you to that effect — I shall endeavour to have them notify you where and when to draw on every large order as I expect these will be made by ~~Cable~~ letter instead of Cable

Yours

Batchelor

Exposition Internationale d'Electricité

PALAIS DE L'INDUSTRIE
Salles 24 & 25
DIRECTEURS
M.M. CHARLES BATCHELOR
OTTO A. MOSES

LUMIÈRE ÉLECTRIQUE EDISON

Paris, le 11 February 1882 18

Représentants de Mr EDISON
M.M. Pushins & Bailey
33, Avenue de l'Opéra, 33

Thos. A. Edison Esq 65 5th Avenue
New York.

My dear Edison,

I acknowledge receipt of your cable as follows:— "You must authorize me draw immediately on ordering for your account I promise payment and am greatly compromised by your not providing me with funds. adequate been working some time on resistances will ship in two weeks cannot have nickel moulds made here unless you guarantee importation will not vitiate patents adequate will make mercury cocks in lots amid amber cents.—

In regard to the first part of this I could not understand it as we had cabled you at least 8 hours before £4000 credit but I looked up the telegram and found Bailey had made it 3 days sight I presume this was an oversight of Bailey's and I sent

Exposition Internationale d'Electricité

LUMIÈRE ÉLECTRIQUE EDISON

PALAIS DE L'INDUSTRIE
Salles 24 & 25
DIRECTEURS
M.M. CHARLES BATCHELOR
OTTO A. MOSES

Paris, le _____ 18__

Représentants de Mr EDISON

MM. Pushins & Bailey

33, Avenue de l'Opéra, 33

2

A note to him late last night asking him to have it arranged so as to cable you to draw at sight instead — We shall arrange these matters better after a little while — Your letter to Mr Porges tickles the old man so that he does not where he stands — I have seen Consul General Walker and my testimony will cost $50 about; but for some reason they are waiting I presume they have to receive notice from your side of the Atlantic before they can take it — I think now it is not necessary for Force's as he is at St Petersburg and in about 3 weeks will go to Finland — Strasbourg plant never missed an hour since we patched it and it runs from sunset to sunrise

Yours Batchelor —

Aud via Queenstown

Paris February 13th 1882

Thomas A. Edison Esq.

New-York
65 - Fifth Avenue

My dear Sir,

I have had much pleasure in receiving your esteemed favor of January 23d

We have begun to organize the three Electric Companies.

Yesterday I have been to visit the manufactory at Ivry, which indeed is one of the most beautiful establishments of Industry in France. I have no doubt but Mr. Batchelor will have informed you sufficiently on this subject.

The boards of directors of the three companies have decided unanimously to name you each its "President honoraire". This title does not involve any liabilities nor obligations. Will you be kind enough to let me or Mr. Bailey know by telegram whether you

accept this title.

I am my dear Sir
Very truly yours

Charles Page

Recd 11 Mar 1882

Société Electrique Edison.

Paris. Le 14 Février 1882.

Thomas A. Edison Esq.
President of the Edison Machine Work.
New-York.

Dear Sir,

We beg to remit you here-enclosed 3 lists of the different items which must compose in future the 3 kinds of Plants we shall have the pleasure to order.

Please take exact note of these lists, as the Plants must consist precisely of these items, neither more nor less.

We Remain,
Dear Sir,
Yours very Faithfully,

A G Chatard

administrator.

3 lists.

Acknowledge receipt. Pray have further Mr Batchelor on the subject.

[ENCLOSURE]

Plant for 40 A Lamps and 40 B. Lamps consists of.

1 Dynamo Z.
1 Regulator.
40 A Lamps
40 B. Lamps.
80 Sockets 1/2 with Cocks
1/2 without Cocks.
25. Cutouts.
125 Plugs assorted.
125 Small Cleats.
75 Large Cleats.
12 Clamps.
7 lb. Staples.
26 lb. Assorted house wire.
12 Brushes.

Voice

[ENCLOSURE]

Plant for 60 A Lamps consists of.

1 Dynamo Z
1 Regulator.
60 A. Lamps.
60 Sockets 1/2 with cocks.
1/2 without cocks.
20 Cutouts.
100 Plugs assorted.
100 Small Cleats.
50 Large " .
10 Clamps.
5 lb. Staples
22 lb. Assorted house-wire.
12 Extra Brushes.

Recalled

[ENCLOSURE]

Plant for 120 B Lamps consists of.

1 Dynamo Z.
1 Regulator.
120 B. Lamps.
120 Sockets 1/2 with Cocks.
1/2 without Cocks.
30 Cut Outs.
150 Assorted Plugs
150 Small Cleats
75 Large Cleats.
15 Clamps.
10 lb. Staples.
22 lb. Assorted House Wire.
12. Extra Brushes.

See bill March 8

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Ans'd 5/3/82

Ivry-sur-Seine. le 14 Feb. 1882.

Thos. A. Edison Esqr.
65 5th Avenue
New York.

My dear Edison,

Seubel's wife and 2 children will call on you about a week after this and I wish you would let her have what money she wants to come here — Seubel wants first class ~~passage~~ passages to Cherbourg by German line for them — He will arrange for the payment of this with me and he also requests that you let me know what he is indebted

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Ivry-sur-Seine. le

to you for money already advanced to his wife — If Mr. Seubel has not any one to look after these berths for her perhaps Insull or Mr. Mott would kindly do it for her

Yours
"Batch"

English Light

Feb 14.82

Batchen

Ask Duane to write immediately the News she sends and in what bout

Paris Le 18 Février 1882

Monsieur Sigismund von Kleist.
S. W. Großbeeren Straße 18.
Berlin.

J'ai bien reçu vos honorées du 11 et 20 Janvier et 13 Février, dont j'ai bien pris connaissance; je regrette de n'avoir pu y répondre plus tôt, mais j'ai été absolument absorbé par la constitution et l'organisation de notre Société.

Je vois avec grand plaisir que vous avez reçu des demandes importantes pour l'application de notre système d'éclairage à Berlin.

Pour que ces demandes puissent être soumises à notre Conseil d'Administration, nous vous serons obligés de vouloir bien demander aux chefs des divers établissements que vous nous citez de vouloir bien les formuler par écrit et de les signer, nous nous empresserons de leur faire connaître toutes nos conditions.

Sur toutes les commandes qui nous parviendront par votre entremise la Société vous allouera une commission de douze pour cent (12 %)

Je suis très content personnellement de voir que vous êtes entré dans une voie pratique.

Nous préparons des circulaires et prix courants que nous vous adresserons dès qu'ils auront été imprimés et qui vous permettront de donner tous les renseignements désirables.

La dernière Assemblée constitutive de notre Société a eu lieu hier. Je suis absolument absorbé par l'organisation de nos services.

Dans l'attente de vos bonnes nouvelles, je vous prie d'agréer, Monsieur, mes salutations empressées,

J. M. Bailey

PS When I received this letter I was gone again to Paris, where it followed me. Formerly I resided Großeeren Straße No 18 and Hôtel du Nord. J. von Kleist

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON
Société anonyme. Capital: 1.500,000

Ans 24/2/90

Ivry-sur-Seine. le 22 Feb

My dear Edison

Please send price of large special punch press for armature discs of large machine & when it can be delivered —

Also give details of all new things in manufacture of large machine

Batchelor

Soc. Fr. Electrique

Answ

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le 26th Feb. 1882

Mr T. A. Edison

Dear Sir

Four days ago I returned from Milan Italy, where I was sent by Mr Batchelor to install a plant. Mr Shepherd the Company's Agent succeeded in obtaining the entry to the Scala Theater, in the "Redotto" or drawing room of which are three chandeliers containing in all 92 gas jets. I replaced each of the jets with a "B" lamps. I put one "A" lamp in the private box of one Sig. Bussie, the ~~Ch~~ Cashier of the Bank of Italy, also one "A" in the Courtyard of the Royal entrance to the theater, also one "A" and 2 "B" in the engine room. It was a most perfect success. Several gentlemen who were at the Paris Exposition and in London, agreeded it was the finest exhibit of electric lighting they had yet seen. Even the agent of Siemens agreed to this.

The people were wild over it. At the time I left Milan there were excelent prospect for the formation of a company of five or six million francs. for the opperation of Italy entire. It is I think the desire of the Paris Company to divide Italy giving to one Major Garbin the southern portion.

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le 188

The company here were not sure of Mr Shepherd as he was unknown to them. Having been in Milan for one month I am free to say, Mr Shepherd has a very wide circle of influential friends, is greatly liked and stands strong in Italy. His friends reach out pretty much all over Italy.

Knowing you can roll the ball in either direction. I write in the interest of both Mr Shepherd and myself. I have already talked with Mr Batchelor of this and told him that the leaders of this Milanese Company hold out to me the Chief Engineership of their Company. and that I left Milan with the understanding that in case they were successful in their treaty with the Paris Company I would after the Completion of my duties at the factory here, which probably will be in five months, return to Milan permanently

It is not my intention to remain in France. Indeed I may not be wanted. There is nothing for an American in France. The French know it all. I am now doing what you in the shop at Menlo Park engaged me to do, namely assist in getting into operation a factory in France

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le 188

after this is done, which will be long, I will consider my work in France completed, and I shall then look for other fields, when the grass grows longer and is more easily gathered.

Every thing is tending toward an early starting of lamp factory. The buildings at Ivry are used adopted for our work.

I was rather uncertain whether to write you or not, as in case Mr Batchelor heard of it he might think it unjust to him. I hope this will not occur as I have the kindest feeling toward him, and am determined to render him all assistance possible. I was induced to write you, knowing you rejoice in the success of your subjects and the gratification of their ambition.

You may consider Italy a most promising field for the Edison light.

Yours very Respectfully

E. G. Acheson

P.S. I may add that Mr Batchelor is satisfied that I go into the engineering dep^t after the factory is going. As Stipple will then run it.

Acheson

[TRANSLATION FOLLOWS]

N° 3.

7, Rue Scribe.
Paris, le 27 Février 1882.

« Tutus in cavendo »

Monsieur,

J'ai l'honneur de vous confirmer ma lettre circulaire du 20 courant.

Prochainement, je placerai sous vos yeux un exposé de tous les systèmes d'Eclairage Electrique, aujourd'hui, je continuerai à vous entretenir des différentes valeurs qui représentent actuellement le Système Edison.

Ces valeurs sont :

1° Les actions de la "Edison Electric Light Company," Société américaine originairement au capital de $ 300,000 et actuellement à celui de $ 480,000, divisé en 4800 actions de $ 100 chacune. Une récente décision des actionnaires vient d'élever ce capital à $ 720,000;

2° Les actions de la "Edison Electric Illuminating Company of New-York", Société américaine au capital de $ 1,000,000, divisé en 10,000 actions de $ 100 chacune;

3° Les actions de la "Edison Company for Isolated Lighting", Société américaine au capital de $ 500,000, divisé en 5000 actions

[TRANSLATION FOLLOWS]

de $ 100 chacune;

4° Les actions de la "Edison Electric Light Company of Europe (Limited)" Société américaine à responsabilité limitée, au capital de $ 2,000,000, divisé en 20,000 actions de $ 100 chacune;

5° Les actions de la "Compagnie Continentale Edison", Société anonyme française au capital de fr. 1,000,000 divisé en 400 actions de f. 2500 chacune;

6° Les actions de la "Société Industrielle et Commerciale Edison" Société anonyme française au capital de fr. 1,500,000, divisé en 3,000 actions de fr. 500 chacune;

7° Les actions de la "Société Electrique Edison" Société anonyme française au capital de fr. 1,000,000, divisé en 2000 actions de 500 fr. chacune.

La "Edison Electric Light Company" a été formée pour exploiter le système d'éclairage électrique de M. Edison sur le continent américain. C'est une société-mère pour l'Amérique. Elle crée des sociétés locales pour l'Eclairage Electrique des diverses villes de l'Amérique du Nord et de l'Amérique du Sud. C'est elle qui a déjà donné naissance à la "Edison Electric Illuminating Company of New-York" et à la "Edison Company for Isolated Lighting".

La "Edison Electric Illuminating Company of New-York", ainsi que son titre l'indique, a été fondée pour éclairer la Ville de New-York par le Système Edison. Elle a payé à la "Edison Electric Light Company" une redevance de 35 % de son capital, soit $ 350,000.

[TRANSLATION FOLLOWS]

dont $100,000 en espèces et $250,000 en actions. On calcule que, pour éclairer New-York par le système Edison, il faudra que cette Compagnie élève son capital à $10,000,000. Elle devra toujours payer à la "Edison Electric Light Company" 35% du capital additionnel auquel elle pourra s'élever. Cette Société, l'"Illuminating Company of New-York", a été autorisée par le Conseil Municipal de New-York à poser ses fils dans les rues de cette Ville. La canalisation est aujourd'hui achevée sur un parcours d'environ 8 kilomètres dans les rues suivantes: Peck Slip, Spruce, William, Ann et Cliff et les fils ont été posés dans 1,500 maisons. On place en ce moment les machines à vapeur, les chaudières et les machines dynamo-électriques dans la Station Centrale de Pearl-Street, située au milieu du premier district attaqué par la Compagnie.

La "Edison Company for Isolated Lighting" a pour objet de procéder à des installations isolées, c'est-à-dire d'éclairer les châteaux, les usines isolées, les petites localités et les villes où il n'existe pas de réseau central. Cette Société, de création récente, avait fait, à la date du 17 Janvier, à New-York et sur différents points des Etats-Unis, 35 installations d'ensemble 5,000 lampes.

La "Edison Electric Light Company of Europe (Limited)" a été fondée pour exploiter le Système d'Eclairage Electrique d'Edison dans les pays suivants: France et Colonies, Belgique, Danemark, Allemagne, Autriche-Hongrie, Russie, Italie et Espagne (Colonies espagnoles exceptées). C'est une Société-mère pour ces pays. Elle a créé:

1° La "Compagnie Continentale Edison" qui, après remboursement

[TRANSLATION FOLLOWS]

de son capital, lui paiera 80% de ses bénéfices nets; 2° la "Société Industrielle et Commerciale Edison" qui, après prélèvement d'une provision annuelle destinée à amortir son capital, lui paiera 50% de ses bénéfices nets; et 3° la "Société Electrique Edison", qui, après remboursement de son capital, lui paiera 60% de ses bénéfices nets. Sur votre demande, je compléterai cette partie de mes renseignements.

La "Compagnie Continentale Edison" a été formée pour exploiter le système d'Eclairage Electrique d'Edison dans les pays désignés plus haut; elle a pour rôle la prise des brevets non encore délivrés, leur vente et la concession de licences. Dans une certaine mesure, cette Société est la transformation en Société française de la Société Américaine la "Edison Electric Light Company of Europe (Limited)." En ce qui concerne les pays déjà cités, c'est aussi une Société-mère. C'est d'elle que procéderont toutes les sociétés qui voudront entreprendre l'éclairage par le système Edison des différentes villes de France et des pays étrangers qui sont de son ressort. Les progrès de la "Compagnie Continentale Edison" dans ce sens, en France et à l'Etranger, sont déjà considérables. Il y aurait indiscrétion de ma part à m'étendre davantage sur ce point en ce moment. J'y reviendrai en temps opportun.

La "Société Industrielle et Commerciale Edison" a pour objet la fabrication et la vente des appareils nécessaires à l'Eclairage Electrique par le système Edison; c'est-à-dire

[TRANSLATION FOLLOWS]

des machines dynamo-électriques, des tuyaux, des lampes Edison, etc. – Elle occupe à Ivry-sur-Seine une usine importante d'où sortiront bientôt chaque jour 500 lampes, ainsi que le nombre de machines dynamo-électriques nécessaires à leur fonctionnement.

La "Société Electrique Edison" a pour but de faire des installations isolées d'Eclairage Electrique système Edison, dans les châteaux, les usines isolées, les localités d'une population inférieure à 10,000 habitants et dans les villes où il n'aura pas encore été créé de réseau central.

Ces trois sociétés françaises ont été fondées sous les auspices et par les soins de la Banque Centrale du Commerce et de l'Industrie, société anonyme au capital de 25 millions de francs dont 12,500,000 versés, laquelle a pour Président M. Charles Borgès. Il n'a pas été créé d'actions d'apport; le capital de ces trois Sociétés, soit ensemble 3,500,000 francs, est un capital effectif qui a été versé intégralement en numéraire.

L'Eclairage Electrique Edison a donc fait son entrée sur notre marché financier. Il y a été accueilli par un groupe connu qui, sans bruit, sans faire appel au public, a lui-même souscrit et versé les 3,500,000 francs requis pour commencer à éclairer à la Lumière Electrique Edison, la France et le reste du Continent Européen. Je dis "commencer" parce que c'est par dizaines, par centaines de millions qu'avant peu se chiffreront les capitaux engagés dans la lutte de l'Eclairage Electrique contre l'Eclairage au Gaz.

[TRANSLATION FOLLOWS]

L'exploitation en Angleterre, en Portugal, en Suède et en Norvège, n'a pas encore fait l'objet de Sociétés par actions. M. Edison a traité pour ces pays avec une puissante maison de Banque qui, avant de s'adresser au public, a voulu démontrer pratiquement en Angleterre, là même où le prix du gaz est le moins élevé, (puisqu'il s'y vend 15 centimes le mètre cube tandis qu'en France, par exemple, nous le payons le double), que même dans les pays de gaz à bon marché le système d'Eclairage Electrique Edison peut lutter avec avantage contre le gaz. Une installation a donc été faite à l'aide de capitaux privés à Londres, au Holborn Viaduct, où 1,300 lampes éclairent les rues, les boutiques, les bureaux et jusqu'à une église. Un prochain avenir nous réserve de ce côté d'utiles enseignements.

En résumé, Monsieur, de toutes les valeurs dont la nomenclature précède, celle qui aujourd'hui se recommande le plus particulièrement au spéculateur et au capitaliste est, selon moi, l'action de la "Edison Electric Light Company of Europe (Limited), et ce, pour deux raisons. D'abord, parce qu'il reviendra à cette action une large part des bénéfices que l'Eclairage Edison pourra réaliser sur le continent Européen; ensuite parce que l'Europe Continentale étant le champ d'exploitation de cette société, c'est ici, en Europe, et non plus à New-York, qu'en raison des facilités ou des entraves que l'Eclairage Edison rencontrera dans sa marche sur notre continent, se détermineront jour par jour les cours de cette valeur. Son marché naturel est donc l'Europe et spécialement la France, qui, par suite des traités intervenus entre le groupe Porgès et la "Edison Electric Light Company of Europe (Limited), est devenue la tête de ligne du continent européen, en ce qui concerne

[TRANSLATION FOLLOWS]

l'Eclairage Edison.

Ainsi que je l'indique plus haut, il existe 20.000 de ces actions dont quelques centaines ont déjà franchi l'Atlantique et sont entrées ici au pair et même au-dessus du pair, dans plusieurs portefeuilles des mieux composés. Il y a de 1,000 à 1,500 titres flottants, que l'on pourrait avoir en ce moment aux environs du pair. Je suis d'avis qu'aussitôt cet appoint classé, ces actions monteront à des cours très élevés.

Je reviendrai sur cette valeur.

Entre temps, je sollicite la faveur de vos ordres d'achats et de vente de valeurs d'Eclairage Electrique, et je vous salue.

A. Becquet

[TRANSLATION]

No. 3.

7, Rue Scribe

Paris, le 27 Fevrier 1882.

"Tutus in cavendo"

Sir:-

I have the honor of confirming my letter of the 20th inst. I will shortly lay before you an exposé of all the systems of Electric Lighting; to day I will inform you of the different securities which actually represent the EDISON SYSTEM.

These securities are

FIRST. Shares of the EDISON ELECTRIC LIGHT Co. and American company originally with a capital of $300,000 actually of $480,000, divided in 4,800 shares of $100 each. A recent decision of the stockholders has increased this capital to $720,000;

SECOND. Shares of the EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK, an American company with a capital of $1,000,000 divided in 10,000 shares of $100 each;

THIRD. Shares of the EDISON COMPANY FOR ISOLATED LIGHTING, an American company with a capital of $500,000, divided in 5,000 shares of $100 each;

FOURTH. Shares of the EDISON ELECTRIC LIGHT COMPANY OF EUROPE (LIMITED), an American company of limited responsibility, with a capital of $2,000,000, divided into 2o,000 shares of $100 each;

FIFTH. Shares of the COMPAGNIE CONTINENTALE EDISON, a French joint stock company with a capital of fr.1,000,000

[TRANSLATION]

divided into 400 shares of fr. 2500 each;

SIXTH. Shares of the Societe Industrielle et Commerciale Edison, a French joint stock company with a capital of fr. 1,500,000, divided into 3,000 shares of fr. 500 each;

SEVENTH. Shares of the Societe Electrique Edison, a French joint stock company with a capital of fr. 1,000,000, divided into 2,000 shares of fr. 500 each.

The EDISON ELECTRIC LIGHT COMPANY was formed for the purpose of exploiting Mr Edison's system of electric lighting on the American continent. It is a parent company for America. It will form local companies for electric lighting of the different cities of North and South America. It has already given birth to the EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK and to the EDISON COMPANY FOR ISOLATED LIGHTING.

The EDISON ELECTRIC ILLUMINATING COMPANY OF NEW YORK, as it name indicates, was founded for the purpose of lighting the city of New York by the Edison system. It has paid to the Edison Electric Light Company for its license 35 per cent of its capital, that is to say $350,000 of which $100,000 cash, and $250,000 shares, It is calculated that it will be necessary for this company to raise its capital to $10,000,000 for the purpose of lighting New York by the Edison system. In any event it will have to pay to the EDISON ELECTRIC LIGHT COMPANY 35 per cent of the additional capital to which it can be increased. This company the ILLUMINATING COMPANY OF NEW YORK, has been empowered by the Municipal Council of New York to lay its wires in the streets of that city.

[TRANSLATION]

The canalization has been finished for a distance of about eight kilometers in the following streets: Peck Slip, Spruce, William, Ann, and Cliff and wires have been laid in fifteen hundred houses, At this moment steam engines, boilers, and dynamo-e electric machines are being put up in the central station, Pearl St., situated about the middle of the first district taken in hand by the company.

The EDISON COMPANY FOR ISOLATED LIGHTING has for its object the installation of isolated plant . That is to say, to light country seats, isolated factories, small localities and cities where there are no central systems. This company recently formed has installed up to the 17th. of January 35 plants with 5000 lamps in New York and different points in the United States.

The EDISON ELECTRIC LIGHT COMPANY OF EUROPE (LIMITED) was formed for the purpose of exploiting the Edison system of electric lighting in the following countries : France and her colonies, Belgium, Denmark, Germany, Austro-Hungary, Russia, Italy and Spain (Spanish colonies excepted). It is apparent company for the above countries. It has created:.

FIRST. The Compagnie Continentale Edison which, after reimbursing its capital will pay to it 80 per cent of the net profits: 2nd. The Societe Industrielle et Commerciale Edison which after deduction of an annual provision for retiring its capital, will pay to it 50 per cent of the net profits; and

THIRD. THE SOCIETE ELECTRIQUE EDISON which after reimbursement of its capital will pay to it 60 per cent of the net profits. If requested I will give further and complete information

[TRANSLATION]

The COMPAGNIE CONTINENTALE EDISON was formed for exploitting the Edison sytem of electric lighting in the companies above designated. Its place is to take out patents not yet delivered to sell them and to grant licenses. To a certain degree this company is a transformation into a French company, of the American company, viz. The Edison Electric Light Company of Europe (limited) As far as concerns the countries above cited it is also a parent company. Out of it will proceed all companies which will undertake by means of the Edison system to light up the different cities of France and foreign countries covered by its rights. In this direction the progress of the Compagnie Continentale Edison in France and elsewhere are already considerable. It would be indiscreet for me at this moment to expatiate further on the present point. T will recur to it hereafter.

The Societe Industrielle et Commerciale Edison has for its object the manufacture and sale of all apparatus necessary for electric lighting by the Edison system; that is to say of dynamo-electro machines, tubes, Edison lamps &c. It occupies at present an important factory at Ivry-on-the-Seine which will turn out very soon 500 lamps a day; as well as the number of dynamo electric machines to run them.

The Societe Electrique Edison has for its object the installation of isolated plants for electric lighting by the Edison system in country seats ,isolated factories and localities with a population less than 10,000 and in cities where a central system shall not have been established.

These three French companies were formed under the auspi-

[TRANSLATION]

ces and by the efforts of the Central Bank of Commerce and Industry a joint stock company with a capital of fr.25,000,000, -12,500,000 paid up and which has Mr Charles Porges as President. There were no (apport)shares issued; the capital of the three companies was a total of fr.3,500,000, an actual paid up cash capital. Edison's electric lighting has entered into our financial markets. It has been received by a well known group who without noise or appeals to the public has itself subscribed and paid in the fr. 3,500,000 required to commence lighting France and the rest of the continent of Europe with the Edison Electric Light. I say "commence" because the capital engaged in the struggle between electric lighting and gas lighting, will in a very short time be counted by tens and hundreds of millions.

The exploitation in England, Portugal, Sweden and Norway has not yet been undertaken by joint stock companies. An eminent banking house with whom Mr Edison has treated for those countries has desired to practically demonstrate in England ~~xxxx~~ before addressing themselves to the public that the Edison Electric Light system can successfully compete with gas in a country where gas costs least (the price being 15 centimes the cubic meter while in France it costs double that amount). For that purpose an installation has been made by private capital in London at Holborn Viaduct where 1,300 lamps light the streets, stores, offices and even a church. We expect useful information in the near future from this source.

To sum up all, of the above named securities the one

[TRANSLATION]

which most recommends itself to both speculator and capitalist is, in my opinion, the shares of the Edison Electric Light Company of Europe (Limited); and this I hold for two reasons; first, to these shares will accrue a large part of the profits to be realized by the Edison lighting on the European Continent; and because the European Continent being the field ~~xxxxxx~~ of exploitation by this company, it is here in Europe, and not in New York any longer, ~~for it is~~ (by reason of the facilities or trammels that the Edison lighting will encounter in its progress on our continent) that ~~xxxx~~ its quotations will from day to day be determined. Its natural market is then Europe, and especially France, which, by means of the contracts entered into between the Porges group and the Edison Electric Light Company of Europe (Limited), has become the head of the European Continental Combination ~~as~~ far as concerns the Edison lighting.

Thus, as I have above indicated, there exist twenty thousand of these shares, of which some hundreds have already crossed the Atlantic and have come on the market at par, and even above par, and found their way into very strong hands. There are about one thousand to fifteen hundred floating shares which could be had at this moment in the neighborhood of par. I am of opinion that as soon as these ~~have~~ been placed, these shares will rise to a very high figure.

I will recur to this security. In the meantime I beg to solicit the favor of your orders for buying and selling electric light securities. Very respectfully,

A. BEQUET.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON
Société Anonyme, Capital : 1,500,000 Francs

Ivry-sur-Seine, le 6 March 1882

Ans 6/4/82

Thomas A Edison
65 Fifth Avenue
New York.

Sir

I acknowledge the following cables —

27 February —

"Frank Halzer has good, Swiss work here wants thirty dollars week travelling expenses & board while there Hiffel has made good Springs here, shall we send sample latest Springs."

Also 3 March

"Bradley has man wants three dollars day expenses both ways understands cutting & fitting machines drawings central station dynamo go shortly cause delay many changes construction: cable shifting directions twenty plants must pay for these friday shall I drawn on Chevers - Ethroside."

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON
Société Anonyme, Capital : 1,500,000 Francs

2. Ivry-sur-Seine. 6

As regards Frank Halyer the only reason why I wanted him was because Hippl has a good deal of work to do to have other men & I did not want to employ a man to make our fuses who could afterwards be easily bought off by Swan or Edison. I shall however hire a man for the purpose & keep him entirely separate from the other parts of the manufactory.

I have cabled you therefore to send me some of the latest fuses.

As Bradly's man cannot fix the machines nor grind the knives he is no good to me for we have some remarkably smart little Frenchmen who work cheaply here & I shall have my trouble in getting what I want in this line I thought in telegraphing you for these men I could get first what I want, has no doubt we shall very shortly have to split up our force, things are well on the way for a factory as large as this in Jersey & a small one in Barcelona.

Your letter of the 17 of Feby to hand enclosing full bills & shipments for "Société Electric"

I have handed them over to the at company.

"I note your code word "Consummate" meaning "Ship to Hayward Perry & Frontheim agent at ——"

As also your information regarding the foreign houses of this house. Have received also the bill of Oldenbourg of Munich against Th A Edison

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON
Société Anonyme, Capital : 1,500,000 Francs

Ivry-sur-Seine. 6

3

and will pay the same immediately
We are progressing well with the Factory but find it very difficult indeed to get machinery in a short time.
I have however secured almost all the machinery I want for three plants a day (complete) As soon as I get your drawings I shall order complete machinery for turning out one large dynamo every month
Should be glad if you would send me the price of Porter's engine delivered in Paris also in Hamburg & how soon some can be delivered
I confirm my cable of March 2nd as follows "Send taps for measuring coils."

Yours truly
Chas Batchelor

1650

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Societe Anonyme Capital Fr 1,500,000

Ivry-sur-Seine le 7 Mars 1882

My dear Edison,

Received your cable "arranged your new issue boring long ago dont sell present low prices written today" which is in answer to my cable on same subject — For which "thanks" and will wait letter —

Insults letters of 23 Feb to hand enclosing: —

Bills lading "Canada" Havre	Boring bar Dynamometer
Bills lading "Vandalia" Hamburg	21 Cases Electrical Mach.

Statement Feb 22nd 1882
Bill $501.80 Feb 22 1882
Bill $1229.35 " "

All of which I have put into the hands of the Committee who

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Ivry-sur-Seine le

2

run the Société Electrique Edison

Yours
"Batch"

1882-03-08

Acknowledge receipt. Say can we have plans to work by when you receive letter

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le March 8. 1882.

Thomas A. Edison Esq.
New-York.

Dear Sir,

Referring to our respects of 14 February, enclosing 3 lists of the items composing the 3 kinds of Plants, we beg you to consider these lists as void.

We take much pleasure in sending you 3 new lists, under date of 8 March, giving you the exact composition of items for the 3 kinds of Plants, as Mr. Batchelor has established it now.

Please note the change for the quantity of a posted house-wire, and use only these new lists.

We Remain,
Dear Sir,
Yours very Faithfully,

3 lists.

LE COMITÉ DE DIRECTION

Administrateur

Chalarez

[ENCLOSURE]

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le March 8 1882.

Plant for 40 A Lamps and 40 B Lamps must consist of:

1 Dynamo Z.
1 Regulator
40 A Lamps
40 B Lamps
40 Sockets with cocks.
40 Sockets without cocks.
25 Cutouts.
125 Plugs assorted.
125 Small bleats.
75 Large bleats.
12 Clamps.
7 lbs. Staples.
1/2 lbs. Assorted house-wire.
12 Extra Brushes.

[ENCLOSURE]

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le March 8. 1882.

Plant for 60 A. Lamps must consist of.

1 Dynamo Z.
1 Regulator.
60 A Lamps.
30 Sockets with cocks.
30 Sockets without cocks.
20 Cutouts.
100 Plugs assorted.
100 Small Cleats.
50 Large Cleats.
10 Clamps.
5 lbs. Staples.
132 lbs. Assorted house wire.
12 Extra Brushes.

[ENCLOSURE]

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le March 8 1882.

Plant for 120 B Lamps must consist of

1 Dynamo L.
1 Regulator.
120 B Lamps.
60 Sockets with cocks.
60 Sockets without cocks.
30 Cutouts.
150 Plugs Assorted.
150 Small Cleats.
75 Large Cleats.
15 Clamps.
10 lbs. Staples.
220 lbs. Assorted house wire.
12. Extra Brushes.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

RECEIVED
APR 3 1882

ANSWERED

Ivry-sur-Seine. 6 Mch 16

European Light
Batchelor

N.Y. 188

My dear Edison,

Acknowledge cable "Can I pay Bergman under my authority draw on Speyers for orders given him by you direct"

Have just received this "Tammerfors Finland first installation here completed perfectly successful head people of town present drank to Edisons health Gottbeck"

Yours
Batchelor

THE EDISON LAMP COMPANY,

Menlo Park, N. J., March 16th 1882

Samuel Insull Esq

I received a letter from James Hipple in Paris in which he states that Mr Batchlor had telegraphed for me. Have any satisfactory arrangements been made in regard to me going. If not inform me of the Person that is going in another Department as Mr Hipple requested me to bring or send to him some articles which he cannot obtain there.

An early reply will greatly oblige

Yours Respectfully
Frank Holzer

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Ivry-sur-Seine. le 18 March 82.

RECEIVED
APR 3 1882
ANSWERED
.....188...

Thomas A Edison
65 — 5th Avenue
New York.

Sir

Please send immediatly drawings of 200 Light dynamo for A lamps. I cabled you to day, that we could do without Haulgers or Bradley's man if possible

Yours Faithfully
Chas Batchelor

P.S. I thought it better to learn a man here the fibre business, as you said Bradley's man was no good for anything but just cutting — Holger I consider too high priced — I can get plenty of good glass blowers here very cheap and have built a room simply for pumps so as to keep the pump man entirely away from the pump room

Yours &c.

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

RECEIVED
APR 10 1882
ANSWERED
.....188...

Paris le 26 March 1882.
33 Ave de l'Opera

Samuel Insull Esq.
65 Fifth Avenue
Newyork

Dear Sir,

Herewith enclosed please find copy of contract as signed, also by same post copies of Statutes of three companies containing report of operations of the Companies since their organization, commenced in letter of 24th inst.

We have signed contract for the formation of a company for the City of Besançon a city of about 100,000 inhabitants. 1,000,000 francs of which we receive 45% in shares fully paid up and 20% in the successive augmentations. An application has been made also for the formation of a company for the City of Dijon, and the negotiations are now in progress. The contract for Strassbourg is not yet signed. The people there have made an estimate that is now being examined by us from which it would appear that no profit can be made selling light same price as gas, and we may propose a change in basis heretofore agreed

A plan of contract for the establishement of a factory and an exploitation C. in Spain has been agreed on and has been sent to Spain for acceptance by the representation of the group in that country; Bailey leaves for Italy to morrow morning, to bring to a close negotiations pending with Garbi and others. — We have today received advice of the constitution of a group at Francfort-sur Main to treat for the light. We hope to combine these people with the Berlin people to see whom Rau is now there. — We hope just accepted propositions for representation and formation of a group for the ancient Kingdom of Poland,

An option for Wurtemberg has also been agreed on the basis of an obligation to place a certain number of small plants in each town of more than 10.000 inhabitants before six months from date,

These are only the more important matters that have been done or an in course of execution.

Several changes more or less important are found necessary in the contract. In France and perhaps in Italy the basis of a share interest for the patents will be to a considerable extent practical, But in Germany and probably elsewhere, to an extent that we cannot now determine even in France it will be necessary to base the contract on a percentage on material furnished for central stations and on the supply of Lamps. The limit of 20 % to profits of factory is not practicable except where the same gebeur organizes factory & takes exploitation, A provision

in all contracts for factories, that the price of materials shall not exceed that of the Paris factory or if it does that the Continental or local companies, may order elsewhere gives an equal and sufficient guarantee, and makes the affair more tempting to capitalists. These are only examples. It was well to insert the provisions referred to and others, in the contract, in as much as these conditions are in all cases extreme in our favor, and whatever modifica = tions are necessary the Newyork Company holds the advantage and can, in reason, dictate the nature and extent of changes to be allowed. It is quite impossible to present all these matters adequately by letter. So as to secure a harmonious working and for this reason, Bailey will leave for the States the latter part of april as cabled you yesterday.

There are also other important matters that we think personal representation would advance the settlement of, E.G. the arrangement of the Commission agreed to Pickas & Bailey, and the matters growing out of the annulation of the Paris syndicate matter We have taken engagements to make representations to you and to endeavour to procure a recognition of the advantages secured to the Newyork Company, by the abandonment of this contract and the merging in the European affair. These engage = ments are conditioned on the realization of the advantages supposed to accrue to the Newyork Company It was utterly impossible to present the matter by

telegram, and there was no time to do it by correspon-
dence. In the interest of the company, and provided
the supposed advantages shall be realized. We have
no doubt a consideration (the exact amt. of which
has not been fixed, but to be determined by a friendly
understanding) would be granted by the company. —
We beg to say in conclusion that the business here
is taking a great extension, and no other affair
of Electricity is taking a development that bears
any comparison to it. The Brush people are using
your lamps, Siemens, has just brought 550 for Berlin,
and all the indications are of the most favorable character.
Our relations with French gentlemen in the enterprise
are of the most cordial character on all sides.

Very truly yours
Truskas S. Bailey
Y.

Société Industrielle et Commerciale Edison
Société Anonyme, Capital : 1,500,000 Francs

Ivry-sur-Seine le 27 March 1882

Samuel Insull Esq.
65 Fifth Avenue - New York.

Dear Sir

Dyer informs me that you have ordered him to stop sending me reports as you are sending me them yourself. — I do not like being cut off entirely in this way. You never send me a report and I know absolutely nothing of my own affairs over there, since I left.

Yours most truly.
Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

RECEIVED
APR 10 1882
ANSWERED
188

Ivry-sur-Seine. le 28 March 1882

Thomas A. Edison
65 Fifth Avenue New York

Sir

Messrs Finlayson & Co of Cammeford are very anxious to install a large dynamo for 1000 lights can you let us have a price for it?
The light in St Petersburg & Cammeford continue to give excellent satisfaction
I wish you would please send me full drawings of the 200 light machine.
I called you yesterday the following:-
Abdomen health good he is life of business contracts will be sent do you want all patents taken in your name.
If I thought that Jaley did not write to you regularly I should have written you oftener -
There is no doubt that Jaley has done, and is now doing, all the work of the companies, and the loss of him at present would set the project back at least a year - I do not think he is satisfied, as he feels that this work is not appreciated at home, and I am afraid he will leave it altogether, if he should do so, at present, it would be very disastrous. I have

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Ivry-sur-Seine. le

great difficulties in the factory with the workmen: they are lazy, slow and very bad workmen indeed of 25 workmen hired in the morning sometimes they are all gone before night, this of course takes up a great deal of time & if I loose Jaily's hels in the other two companies I am sure we shall do nothing for the first year.

I should judge from letters received that the European Co. is not quite satisfied with what is being done here but I think you will allow that our orders have been good considering the short time we have been started and the difficulties we have had to overcome. I do not think the contracts are understood over there as I had a letter from Alston in which he says that all the French Companies are frauds and he feels compelled to tell his friends who he had persuaded to put money into stock & bonds of the European Co. that their stock was absolutely worthless. I think Mr Lowrey ought to have explained the thing better than that.

Will you tell me what is your private opinion of our arrangement in Europe?

Yours faithfully

Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1,500,000 Francs

RECEIVED APR 10 1882

ANSWERED

Ivry-sur-Seine. le 29 March 1882

Mr Thomas A. Edison
65 Fifth Avenue New York.

Sir

Received your letters of 16th of March containing bills of lading of shipments made which I have turned over to Societé Electric Edison.

I notice your bill for 25 Patent models for Brewer & Jensen & these ought to have been sent to me as Brewer & Jensen have only our Danish & Russian Patents, the bill also should go to the Cie Continental Edison as they own the Patents and not the Societe Electric.

Yours respectfully Yours.
Chas Batchelor

P.S. I notice you having received a "installment receipt" in favor of Rosanna Batchelor for stock of the "Edison Electric Light Co." —
I also note receipt of letter of Mch 16th. re Bergmann's payments and Luebels' wife
If you will send me a statement of moneys paid to Mr Force from Dec 1st 1881 & all moneys paid to Luebels wife I will collect & for you Yours Batchelor

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ELECTRICITÉ
1881
GRAND PRIX HORS CONCOURS

Paris, le 27 Mar 1882

RECEIVED
APR. 6 1882

ANSWERED
188...

Mag. Editor
F. P. Mariaga
Ed. Elec. Co. of Europe

Dear Sir:

We have not made reports the last week owing to the great pressure of work consequent on the organization of the companies, the necessity for attention to this was so pressing that we do not doubt you will excuse the delay in considering the work done. Also the stenographer hitherto employed having been ill for some weeks it was beyond the strength of one Mr Bailey who was in convalescence to do other work than that above referred to.

The special departments for work have been organized on following basis.

The Committee of Management of the Manfg Co. is composed of Mess Batchelor, Parker, Chatard & Favier, Mr. Batchelor being the Director Delegate & having the signature for all matters and having been voted full power by the Directors.

The Committee of the "Continentale" is composed of MM. Bailey Rand & Magnan, with the two first as active directors in office.

The Committee of the Small plants is, Bailey, Chatard, Servier and Rau, and all the persons named take active part. Mr Servier mainly employed in outside visits. The special direction of correspondence and reception of persons calling, as also the

carrying on negotiations has been with Bailey of necessity as the only one acquainted with various matters in train, and also with the conditions in which negotiations could be made. All the gentlemen above named are taking a more or less active part in the work, and especially Mr. Ram, Chatard and Sennevy gradually weaving Bailey to an extent. The increase of business relations is however so great that there is more than sufficient for all.

The attempt to bring Mr. Wirz in as President failed owing to the financial crash. He not being a business man was frightened by the responsibility of connection with a share company, and

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris, le 188

this failing was increased by the fact that one of his associates in the Institute was president of the Boston Society which went under in the crash. The Sociétés were therefore organized with Mr. Porges as President, of the three, and with Favier as V.P. of Manfg Co.
Bailey " " Continental &
Leon " " Electrique.

The principal matters now in hand are,
(1) An important negotiation is on foot with parties in Germany since some weeks, involving the starting of a factory and a

company for exploitation: the factory with capital of 1,500,000 marks, and exp. with 2000000 marks. The manufg. Co. is on same basis as the Dairy Co. and the terms proposed for the exploitation is 20% corn, or what comes to us. The latter would make installations of large dynamos for demonstration, for contracts with cities. — We have two plants at Frankfort, which will be put up in few days: another will be shown at Hamburg, also about April 1: the lamps have been shown on Railway train at Frankfort with great success; also at Stuttgart where important installations are in course of being made: at Berlin we shall

vote this afternoon authorizing an expenditure of 100,000 fes for a trial installation, in a building that will give 3000 lamps: The Stuttgart depot is great success, and we are treating for putting in the whole station. We have many other important matters in train in Germany. Bailey went to Frankfort a few days ago, and Ram leaves for Berlin tomorrow night to follow up the affairs in consideration.

Italy. A great success has been made at Milan in the Scala Theatre, where the

light was shown during nearly two months, afterwards in other lighting, and now in the great cafe Baffi of Milan, exciting greater enthusiasm than ever. — We have predispositions for formation of company for Italy with capital of 10,000,000 fcs. We have installations engaged at Rome, Ferrara and other points, as soon as machines arrive. We have also many predispositions for agencies. Bailey says

for Florence day after to-morrow to meet Maj. Garbi, and to organize the various matters in train for Italy. Maj. Garbi was induced towards us by the fact that an exhibition was made at Milan, commenced while we were in the difference with our Paris friends. We have had personal correspondence with him, and all parties here being of accord in desiring to make him representative in Italy hope that by personal

interviews the difficulty will be removed.

Spain, We are about closing contracts giving option for establishing factory, & for exploitation Co, with same parties we wrote about in previous letters. The old negotiation was broken up by the fact that under our statutes the business could not be realized as proposed. We are in doubt whether under Spanish laws patents will not be lost if we import goods into Spain before

manufg, and have ordered to Genova the plant for shipment to Barcelona.

Russia, Very successful exhibitions have been made at St. Petersburg & Sammerfors in Finland, Ten plants have been sold there and are in course of installation by Mr. Nottbeck who has Force with him. We are organizing for Southern Russia & Polish Russia.

Austria-Hungary.

Mr. Francis Duxbury has

ordered 2 plants for Buda
— Pesth. We have agreed
to take part in the Electrical
Exposition at Vienna in
1883 and have taken a
large space. The Emperor's
room at Palace of Exhibition
will be lighted by us.
We have propositions under
consideration for lighting
the Parliament House
at Vienna also a theatre
at Bruni etc. etc. —
One of directors your
company will go to Vienna

in couple of weeks.
~~Ottawa~~ We have orders for
a great factory at Lyons
and shall make installation
in two units.
Belgium. We are now
considering lighting of
Chamber of Deputies at
Brussels; a great factory
at Lys of 2400 lamps;
another at Gand. & several
minor affairs.
Denmark. We are in
correspondence with
parties but have done.

nothing definite
Holland, we have about
closed for an installation
at Amsterdam, in the great
Café Concert Garden of
Krasnapolsky, one of the great
fortunes of Holland, who
proposes to ally himself with
us, & in Rotterdam also
we are in course of making
arrangements for showing
light.

Roumania, we have
an important business
on foot for Bucharest.

13X

This is a rapid review
— a birdseye view only of what
we are doing.

You will readily understand
what labour is involved
in organizing such extensive
operations, and you will
pardon the seeming neglect
of advising you, under the
circumstances referred to
at beginning of this letter.
We suggest that you
use for your circulating only
such matters as here referred

14 1

as done. In the course of April we can count on being better organized and will be in regular informed of progress. Will write you ~~the~~ early next Monday regarding Boundary Claims & other matters of importance before leaving for Italy.

We remain dear Sir,

Yours very truly

Dunbar T. Ward

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

RECEIVED APR 14 1882
ANSWERED April 7 1882

Paris, le 30 March 1882

Thomas A. Edison Esq.
New-York.

Dear Sir

We beg to confirm our respects of March 8 enclosing 3 lists of the items composing the 3 kinds of Plants as they were fixed at that date by Mr. Batchelor.

Please consider these lists of 8 March as void. We enclose 3 new-lists under date of March 30th giving the composition of items, as was agreed to-day with Mr. Batchelor and ourselves.

You will note that we only require now the Dynamos, the lamps and the wire, our Ivry factory can furnish us now with the other articles.

Please address your favors as follows:
Messieurs les Administrateurs de la Société Electrique Edison, 33 Avenue de l'Opéra, Paris.

We Remain
Dear Sir
Yours very Faithfully

LE COMITÉ DE DIRECTION
[illegible]
Administrateur

3 lists.

[ENCLOSURE]

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris, le March 30 1882
RECEIVED
APR 14 1882
ANSWERED
188...

Plant for 40 A Lamps and 40 B Lamps must consist of:

1 Dynamo Z.
40 A Lamps
40 B Lamps
176 lbs. Assorted house-wire.

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris, le March 30 1882
RECEIVED
APR 14 1882
ANSWERED
188...

Plant for 60 A Lamps must consist of

1 Dynamo Z.
60 A Lamps
132 lbs. Assorted house-wire.

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris, le March 30 1882
RECEIVED
APR 14 1882
ANSWERED
188...

Plant for 120 B Lamps must consist of

1 Dynamo Z.
120 B Lamps
220 lbs. Assorted house-wire.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine. le 1er Avril 1882

Thos. A. Edison Esq
65 5th Avenue
New York.

My dear Edison,

I purpose making a demand on the Compagnie Continentale Edison for the reimbursement to me of all monies I spent at the Exposition over and above the 41.730 francs that I drew from the Syndicate on the order of the Edison Electric Light Co of Europe — If I am successful I shall return you your draft of $3000 which I made on you some months ago — I send you enclosed two bills which I wish you would please place to my credit — One is your private expense at Exposition $234.88 the other is the Autographic Expense at same place $540.68 — Please also give me credit for $50 — paid to Geo Walker Consul General for my testimony in the Siemens Edison R.R. Case —

My account with you must be about run out. I wish you would please send me a statement of it — I enclose you a statement as I know it. Yours

Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplome d'honneur Paris 1881

Ivry-sur-Seine, le 11 Avril 92.

Samuel Insull Esq.
65 Fifth Avenue.

Sir,

Your letters of the 25th to hand.

Regards Dr Moses it is simply what I expected from him.

As regards the payments for material for the Ste Industlle, I prefer to give the drafts for that myself, and it is better for you that it is so as you do not have to draw so often on the others.

You see I control personally all payments for the "manufacturing Company" whilst the other payments have to go through a great deal of red tape.

Please bill as soon as possible to the Ste Industlle all that you are making and credit it with the 3000 dollars I send you & let me know by letter when you will be likely to want any more on their account & I will see that you get it without the necessity of calling for it.

Yours

Ch Batchelor

1

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'Honneur
PARIS 1881

Ivry-sur-Seine, le 11 Avril 82

Thomas A. Edison
65 Fifth Avenue New York.

Sir

Drafts. On April 3rd the Sté Indus.lle & Comm.lle Edison sent you a draft for 3000 dollars, please place this to their credit, & acknowledge receipt of it to them.

Also keep their account separate from any other, their account will include everything that Bergmann is making for their manufactory and also the instruments & models rubber corks etc. that are being sent from the factory to us.

B Machines I have had an infernal amount of trouble with those B machines you have sent to Hamburg, five of those machines are still laying in Hamburg, the other five that went to Russia, the agent swears he never will pay for

I have endeavoured to prove to our people that we can use them where we put up more than 60 lights but they are very peculiar

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

2.

people here, and if they get a thing that is not what they ordered it is difficult to talk them into having it. If I had been allowed to bring them into France I could have used them in the lamp factory

Exhibition Tubing. As you well remember I sent all the tubing that I had at the exhibition over to Johnson.

The cost of that Exhibition was so much greater than the money that you received for it that I did not feel justified in turning that tubing over to the company. I should suggest that the tubing was sent there by the Electric Tube Co. for the exhibition and did not come out of the money supplied by the syndicate.

If this meets your views, write me so and I shall say (if we asked about it) just what I have written.

Price Machines. As I cabled you the other day our people are very much afraid of the

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

3

prices of the big machine; also the 200 light machine, they understood from Edison when in London that the 200 light machine was 1000 dollars but when they cabled to you you said $1200.

I wish you would let me know the reason why the large machine is so much as $2000

Very respectfully yours

Chas Batchelor

Martin Force arrived here day before yesterday and will come on with all possible speed

CB.

1882-04-13

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1,500,000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 13 April 82

Mr Thomas A. Edison
65 Fifth Avenue New York.

Sir

Drawings. I acknowledge the receipt of drawings for a "wire cutter" a "lamp heater" a "socket machine" and a "lamp dryer"

Mercury taps. I acknowledge receipt by mail of three "mercury cocks taps" and one "mercury cock"

Martin Force. Martin Force leaves here on Saturday for New York.

I have frequently asked you for a statement of what money you have paid to his wife since the 15th of November 81.

I have received from him before he went to Russia 126 Dollars which I now send you cheque for, and as he is coming himself, he will be able to settle the rest.

This 126 dollars (as I understand it) will refund the money that you have paid his wife up to the end of January; for February, March, & April; he will owe you by the time he arrives.

As regards the payment of his passage back; our people would not pay it, as they thought it

1882-04-13

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1,500,000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

was expensive enough to bring him back from Russia, and have to send another man there.

Cuebels Money Send me word what money you have advanced to Cuebels wife at different times so that I can take steps to secure it for you.

Yours Faithfully
Chas Batchelor

P.S. I have paid today for you £120, to D. H. Brandon for the extension of the Spanish patents Lets 24, and 26 to the Colonies — Am I doing right in paying these bills Brandon presents? and is he authorized to go ahead and get out just what he likes or are you giving him instructions?

CB.

GRAND HÔTEL MILAN
MILAN

European Light
Co.
April 14/82

T. A. Edison Esq
New York

Dear Sir

I arrived at Milan on Tuesday April the 11th at about midnight. On the following day, I hunted up the parties whom I expected to find here. Mr Bailey or Sheppard, but found there was none of them in town then. So I put the meter which I had brought with me from London, in order, and making it registering the current of two "B" Lamps and had a Notary called in to witness it, there was also present, Acherson, and Mr Reisse. ~~on the~~ This was on the 12 of April 1882

On the following day the 13th Mr Sheppard returned and I explained what I had done the preceding evening, and he said that he would send to the rest of it, that when the Affidavit was finished which the notary was writing he would forward it to our counsels at Turin.

The Edison plant works very well here, considering the difficulties under which they labor. The Cafe Biffi which has the light is one of the principle ones in town, and it is said that since he has had it, he does the double the business that he done before. The cafe is situated in the middle of the "Galleries" which is something like the

"Crystal Palace" in London only that the sides are the houses of the street while a roof of ~~gal~~ glass ~~is~~ extends from one side of the street to the other. The whole town comes here in the evening, so that the light could not be exhibited better. They expect to light the Public Hall in about one month, when a banquet will be given in the commemoration of St Gothards tunnel. I shall return to England to day.

Yours very respectfully
Francis Jehu

4 Apr 18 82

Francis B. Stockbridge

Cyrus Eaton

CONTINENTALE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

PARIS 1881

GRAND DIPLOME D'HONNEUR

Paris, le 18 April 1882

Major Eaton

2 V. P. & Manager Ed. E. L. Co.

of Europe, Limited

Dear Sir:

Herewith inclosed please find copies in French, and also translations of (1) Contract of Company with Compagnie Continentale signed and (2) Copy of Contract (provisional) signed by Bailey at Milan April . In expectation that he will leave for the States at an early date we make no remarks regarding (1). As it may be desirable to take action on the Italian business at an early date we call attention to the following facts, — ~~Subsequently to~~ The day of Company the sending of the cable from Milan which gave you outline of plan of contract, ~~and before signature~~ it was agreed that the plan should be modified so as to make the royalty system applicable only during a period of three years, and that, on the formation of said Company, either before expiration of this time or after 20% of shares capital should be allotted in place of the royalties. — Concerning this we beg to

State here precisely what is the royalty plan.

(1) A capital of 1,500,000 fcs given for factory, at once, our interest to be same as in Paris factory 50% profits, represented by founders shares.

(2) The product of the factory after this division separated in two classes.

(1) Objects entering into central systems

(2) Objects " " isolated plants,

3 Lamps,

(1) On objects used in central stations, including dynamos (& engines & parts of dynamos) street conductors, house wire, brackets chandeliers, cut outs regulators etc etc, we to receive 15% royalty.

(2) The profits of small plant business to be equally divided, & no expenses to be charged to this except those directly connected with each individual installation, the general expenses of the affair not to be charged to small plant business.

(3) It is agreed that the cost price of the Camp cannot be greater than that of the Paris factory and the difference between that and the sale price to be divided equally between the Hulana & Continental Companies.

Regarding the Jam we must see how then to resume

1/2 profits of factory

15% on central distilling plant

50% on small plant business with control of supplies

1/2 profits in camp

On Bailey's return from Hulana the Council were declined to consider the 2nd possible purchaser, but on a careful work this idea has been much changed & we invite you to make figures as to as though this has been changed

~~Mochring 5 Wilhelm~~

for Italy we may have to come back to it before closing, and as to Germany it is certain we must take a plan similar. ~~We have~~ Probably the time of experiment in Italy will be reduced from 3 years to 1½ year, as the affair is taking very much. ~~We~~ We have private advices today that the capital has been increased from 4,000,000 to ten to make place for those who want to enter. The Credit Mobilier, Italien and many others in addition to the ~~as well as the~~ Banks named in Baring's cable ~~and~~ have solicited a part in the affair and it is going with great eclat. Regarding the provision for 20% of capital companies formed in Italy, it is our opinion that it will be for the

interest of the affair that this per cent should be reduced by giving a part of it to the Bankers who get up ~~the affair~~. The Italian cities with few and partial exceptions are neither commercial nor industrial; are aggregations of villages, with little wealth and quite generally with limited credit. The ~~introduction~~ use of gas is not at all general. Milan with 330,000 inhabitants has only 30,000 gas lights, of which 4000 are public. Naples is largely lighted with petroleum.

~~The~~ The market nor the purse of the people will not bear any large enterprises and it will be a short sighted policy to load an enterprise in such a country too heavily. In giving if a part of this profit to the Bankers we should

6

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris, le 188

stipulate ~~that~~ what charges they should be allowed to put on the enterprise and protect it on their index as well as ours. In this way probably even 12% to us will be worth more than 20% in other conditions. Besides in obliging them to take their profits with us we take the risk. Guarantee possible for ourselves. — These views have not yet been presented to the conseil and we cannot say whether they will be approved. But should you receive cables this explanation will enable you to understand them.

When Bailey was at Florence he

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Paris, le 188

seemed probable that we should organize several groups, and an understanding was made with Mr Garbi on this basis, we have little doubt that he will be brought in as our representative on the new basis, and we have used ~~the~~ special efforts to bring this about with the gentlemen who are organizing the affair.—

The three Banks, Banca Generale Bunque de Milan and Credito Lombardo are the signataires of the provisional contract, as you will have already concluded the elements brought in embrace

the large majority of the financial interests of Italy.

On the representations of Baily at the ~~last~~ meeting last Friday of Consuls it was voted that proceedings be taken at once against Swan, Lane & Maxim wherever they show themselves in Italy, and instructions to this effect are to be sent to Italy. — The German business is coming to a head also. Mr. Rau left last night for Frankfort & Baily leaves tonight. We advise Mr Insull not work, trusting you,

Pushes & Baily

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 19 Apl 1882.

My dear Edison,

Please give me some information on the 250 light machine as I have no less than 10 to make for France and I cannot tell anything about it —

Does it run by 2 belts or by belt at all?
What is speed and size of pulleys?
Give me something for God's sake.!!!

Yours
"Batchelor"

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs.

Grand Diplôme d'honneur
PARIS 1881

Ivry-sur-Seine, le 26 April 82

Samuel Insull Esq.

My dear Insull.

Thanks for your letter of the 10th. It is full of information, one letter of once a while will be very acceptable.

We have a great deal to do here, and if our work over there could be pushed a little more, it would help us out.

Mercury Works

3 Dynamos and lamps 2 months after we had the factory, and it is just 2 months now and I have not yet got any mercury works.

Lamp Co

I think it is a great shame that the lamp factory still wants more money, it must be very badly managed or by this time it would be self-sustaining.

I have ordered liberally from it but cannot always do so, as we shall have factories enough in Europe to flood the continent.

European Factories

We shall have about $300,000 for factories in Italy, and more for those in Germany, and I want you to ask Edison if he wants

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur
PARIS 1881

Ivry-sur-Seine, le

me to press for factories in every country, or do what I can for factory in America.

My opinion in this is that the only way to bring the Edison lamp down to a proper price, is to establish factories in each country so as to get at the cheapest method of manufacture, and save the enormous customs & freight rates.

The Edison lamp sold to Pt. Rebuga from America costs 50¢ in New York and when received in Italy will be nearly 75¢; so if they do get on any profit at all you see the lamp is very high.

Price of lamps

I have figured it over more times & I do not see why the lamp should cost 35¢, & I confidently believe I shall make them here for 25¢ after a year; although I have a great deal more difficulties to contend with than they have in America.

Yours truly

Ana Batchelor

Avoid Chas Batchelor
Rl May

Memorandum

SOCIÉTÉ ÉLECTRIQUE EDISON
Société Anonyme Capital 1 million de francs

PARIS, le

M. Samuel Insull
New York

My dear Insull Please address all communications to me at for letters
Chas Batchelor
61 Avenue Friedland
Paris

for cables as usual — "Batchelor Paris"
" Cables from Edison. "Ekwoide Paris"
Yours Batchelor

Order No. 47

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme. Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ans 24 May 82

Ivry-sur-Seine, le 1 May 1882.

Thos. A. Edison, Esq
65 5th Avenue
New York.

My dear Edison,

Yours of 6th April relating to Porter's and Arrington engines to hand — Of course I shall be guided in this matter by your experience and cannot do anything till I get the drawings of the machine —

If my man is ready (from the tube works) you can send him along any time — Let him bring full sketches of all he has to put up for manufacturing tubes and a small piece of each size of copper to make the dies from. —

I expect to send 2 men to study central stations in New York shortly

Yours truly

Chas Batchelor

Blank No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company TRANSMITS and DELIVERS messages only on conditions, limiting its liability, which have been assented to by the sender of the following message.
Error's can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages.
This message is an UNREPEATED MESSAGE and is delivered by request of the sender, under the conditions named above.

A. R. BREWER, Sec'y. NORVIN GREEN, President.

READ THE NOTICE AT THE TOP.

Dated London Way Via N.Y. May 4th 1882

Received at Menlo Park N.J.

To Thos A Edison 1 Ex wrd in date

Eknoride N.Y. Send drawings of Eighteen light machine receipts antifriction metal armature tape wide and narrow automatic bed finish copper straightened

23 collect

E+Kr 1250 Cop

400 lb wide for armature.
600 lb - narrow

15-Light
put on drawings
number turns on
bobbin - amount ft size
wire on field

SOCIÉTÉ GENEVOISE
pour
LA CONSTRUCTION
D'INSTRUMENTS DE PHYSIQUE
ET
DE MÉCANIQUE
5, Chemin Gourgas, 5
PLAINPALAIS
GENÈVE

PRIX QUINQUENNAL
DE LA SOCIÉTÉ DES ARTS
1865

MÉDAILLE D'OR
à l'Exposition Universelle de Paris
1867

MÉDAILLE D'OR
à l'Exposition Universelle de Paris
1878

COMPRESSEURS COLLADON
Perforatrices Turrettini & Colladon
Pompes pneumatiques industrielles
MACHINES À GLACE
Système RAOUL PICTET
HYDROMOTEURS SCHMID
Machine GRAMME-à-Lumière
Type Ateliers
Tours à Outils de Précision
Machines à Vapeur
Fourneaux à Gaz Sys^me Perrot
APPAREILS
DE RECHERCHES SCIENTIFIQUES
Appareils de Démonstration pour Colléges
SPECTROSCOPIE & MICROSCOPIE
GÉODESIE & ASTRONOMIE
Etalons Métriques
Divisions Droites et Circulaires
CATHÉTOMÈTRES & MANOMÈTRES
LAMPES ÉLECTRIQUES
Système BURGIN
Lampes à incandescence
Balances de Précision

Genève le 6 Mai 1882

RECEIVED
MAY 23 1882
ANSWERED

FILE No. 188

Monsieur Thomas A. Edison
New York

Cher Monsieur

J'ai le plaisir de vous annoncer que nous avons terminé la première installation de 120 lampes de huit bougies dans le moulins de Mr Roussy à Gilamont près Vevey. Suisse.

La machine a été construite par nous exactement conforme à vos machines à faible résistance pour lampes de huit bougies et a parfaitement réussi. Nous avons pu faire fonctionner avec cette machine environ 200 lampes. La force motrice est hydraulique.

Nous achevons une autre installation de 40 lampes pour le pavillon de Madame la baronne de Rotschild près à Bellevue près Genève et avons plusieurs affaires en vue pour l'éclairage de diverses fabriques en Suisse. J'espère vous envoyer prochainement de nouvelles commandes de lampes.

Veuillez me tenir au courant des nouveaux perfectionnements que vous apporterez sans doute

à votre système, et me dire en particulier si vous avez quelque chose des lampes rigoureusement de 16 bougies, car nous aurions un grand emploi.

Je vous remets ci-inclus la facture des pièces de filature que nous vous avons envoyé à Menlo-Park sur votre demande et qu'il nous faut payer en espèces.

Veuillez nous adresser en paiement 100 lampes de huit bougies.

Je vous prie de présenter mes compliments à Madame et Mademoiselle Edison et vous assurer de ma parfaite considération.

Pierre Alin

P.S. J'attends de vous quelques détails sur nouvelles installations.

Pierre Alin

We just installation finished of 120 lamps (8 candle powers) at Vevey Switzerland dynamo constructed by us exactly as your pattern with low resistance armature for 8 candle p. This dynamo enables us lighting up of 200 lamps.
The motif force is a hydraulic one.
We are working on another installation of 400 lamps in the pavillon Rothschild at Geneva. and many installation for Swiss factories are in view.
Please communicate us new improvements on your system and especially if you succeed in constructing lamps whose average candle power is higher than 16 c. p.
Herewith I include the bill for the platin screws which we sent to Menlo park without receiving any payment.
Please send us for this amount
200 lamps.

Tuvetten.

translated

1882-05-07

Berlin, 7 Mai 1882.
№ 242. Friedrich Strasse № 242

Dear Mr. Edison!

Before I explain you the matter about which I address myself to you, dear Sir, I beg your pardon for my little knowledge of english language and for occupying your costly time with my own business matter. But I am forced to address myself to you after having looked in vain to find aknowledgment alherwhere. During the electrical exhibition I was in Paris as a reporter of several of the first german papers and was — like everybody — highly interested to your admirable and incomparable show in the Palais d'industrie.
Mr. Bailey, your representer, aided me in a very amiable way to make my studies of your experiments and your apparatus and I had the pleasure to publish 7 special articles about your splendid exhibition in the first german papers, among them were the official governementi journals. Afterwards Mr. Bailey initiated me of your intentions and ideas for the introduction of your incandescen lamps and the application of your patents in Europe and he desired my support specially for Germany. I had many long conferences and spended much time and care upon, so much the Mr. Bailey made me the most advantageous promises for my own interest — what I am sure he did in his best intention — knowing Mr. Bailey as a very honorable and conscientious gentleman — Now I waited from day to day for the formation of the great Parisian company, after which

I should have my special order. I remained — by expressly wish of Mr. Bailey 31 days more in Paris as I was obliged by my quality as a reporter, only in the interest of your great entreprise. Then I left Paris with Mr. Bailey's certain assurance to have my satisfactory order in a few days. — Days, weeks and months elapsed without receiving any news, all my letters were either without any answer or I received a short communication, that Mr. Bailey was sick and I should have a satisfactory answer in a few days. During that time I prepared the business as well I could without any written plenipotence and indeed I was the first who made the public and the authorities acquainted with your admirable electric lighting system. — Feeling myself obliged and engaged for your great entreprise by the conditions, which were made to me by Mr. Bailey I refused all other offers for an appointment, among them was a very advantageous offer by the great Transportation — Assurance — Company (Rheinisch Westphälischer Lloyd) and by a journal — publisher at N. Hettin. — When 4 ½ months were elapsed without getting any order and receiving only dubious promises in consequence of my many letters I got into a very painful situation — winning no money at all and having refused all other places. — I addressed myself once more to the Parisian company to give me an idem notification, which was refused. Hearing that Mr. Bailey had quite recovered his health I went — in the month of February — once more to Paris to explain to the Company personally my condition. The members of the presidency would not do any thing for me and after having passed again a fortnight in Paris Mr. Bailey succeeded to persuade me

a favorable contract which contented me 15 percents for every acquisition I would make for the lighting with Edison lamps. – So I was a simple agent of the company without any appointment neither indemnification for my long waiting, for my working and for the great loss I had during 5 month. Now I am — winning not one cent and having no fortune at all — in a very painful position and I do not know how to live during the time until I shal have my first percents for my engagements of establishments. The Parisian Company advised me to the German financial group, which should further my interests as much as possible. I returned to Berlin and was for the moment in a position still more painful than before I left. – Mr. Emile Rathenau, the jewish Director of the german group, proves me as little favour as possible. He tries to lower my percents (to 5 instead of 15, contented me by the Parisian company) and he deprives me even of the publication – right in the papers for not to have to pay the small sums for the articles. I have yet made about 15 very good engagements of establishments to be probably lighted with Edison lamps, but before the installations will be made it will last perhaps one year and then I shall have still many difficulties with Mr. Rathenau and perhaps even a process to getting my percents. Having spended during the long waiting-time all my little money in the interest of your enterprise it is absolutely impossible for me to live further without having an indemnification – sum for all the loss and disapointments I had by the very ignoble action of the Parisian and Berlin company. I am sure, dear Mr. Edison, you to have justice, impartially and observation for my sake, which unhappily I miss

with

your representing Company and I beg you politely and very earnestly to send me as soon as possible a certain identification — which I will — if you want — gladly give back as soon as I shall have my first percents. As a proof of the credibility of my declarations I send you jointly some of the letters I have just at hand this moment and I appeal the witness of the Secretary of the Imperial Telegraph-Office at Berlin, Mr. Happe, who was in Paris at the same time and who was treated in the same way as I am. You can be sure that I will occupy myself further with the same zeal and pleasure with your admirable entreprise and I embress my petition in your impartiality and your favour

Hoping to get very soon a kind answer I remain, dear sir

Very respectfully

Yours

Sigismund von Kleist

No 242 Friedrich Strasse 242 I

Berlin (Prussia)

List of the establishments at Berlin, engaged by my own mediation, to be lighted probably with Edison lamps

1, Royal opera and comedy, 2, Café Bauer 3, The house next door to Café Bauer 4, Mosse's Printing office, 5, Sittenfeld's printing office 6, Central Skating Rink, 7, The Passage (Kaiser Gallery) 8, Union Club 9, Merchants Club 10, Aquarium 11, Architekten Haus 12, Central-Hôtel 13, Disconto Bank 14, Linear Papier Fabrik von Hagelberg 15, Kroll's Gallery.

P.S. If you want to see some of my articles published about your Exhibition in Paris, I will send you some immediately

S. v. K.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital: 1.500.000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 7 Mai 82

Samuel Insull Esq.
65 Fifth Avenue. New York.

My dear Insull.

Telephone royalties

As regards the telephone royalties spoken of in your letter of the 10th, I beg you to tell Edison that I have acknowledge receipt of £445-7-0 "United telephone b^ds" (Reversionary trust") and also £853.5.0 from the Oriental telephone interest.

I acknowledge your letter of the 20th giving me credit for due all amounts. total £897.67.

Also. Your letter of the 21st about the Doctor is very amusing; apparently I am not the only one who considers him impracticable.

A.M.

He however is decidely wrong in thinking that I influenced the European companies against him, I could have got him a very good position with our companies but everybody that he had anything to do with considered him such an infernal bore. that he actualy cut the position out of his own hands, or as one or two expressed themselves to me, "they did not wish to be worried to death" with him!

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur Paris 1881

Ivry-sur-Seine, le 7 May 82

I am very glad you sent me copy letter to Johnson of April 21st

I have not however got the photographs you spoke of there.

I am very sorry to hear that Mr Edison is so unwell.

I wish you would send me at once the prices of all the material that Kreuli makes as well as meters and other things, as I expect to start a couple of central stations outside of France, and shall give order for almost all the material from over there.

Yours faithfully.

Chas Batchelor

Cie CONTINENTALE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le 15 May 1882

My Dear Insull:

Enclosed herewith you will find rough draft of letter regarding Italian contract. I shall write between this & Wednesday mail another letter for you. Have it this mail.

Yours sincerely

J. H. Bailey

[ENCLOSURE]

Enclosed herewith please find copy & translation of Italian contract. Its conditions may be summed as follows, (company to be formed with or more (3 min mg) with minimum)

(1) Total capital 3,000,000 fcs. of which

(2) 1,500,000 is employed for the immediate constitution of a factory to be mounted by engineers furnished by Cont. Company, and

(3) 1,500,000 for exploitation establishment made central stations etc.

2

The company as above is constituted for a maximum period of one year, ~~during the year or the~~ during which a definite organization is to be made, or the patents come back to us.

In the definite company formed ~~two~~ the Cie Continentale is to receive 25% of the share capital also the same in local companies, of this 25% is given back as commission to the Italian Bankers, leaving

[ENCLOSURE]

3

20 % net to Cie Continentale also on all lamps furnished for central stations a royalty of 50 centimes (10 cents is to be paid and on this also 20 % or 10 centimes is given to the Italian bankers as commission leaving 40 centimes for Cie Continentale.

On the factory there is a division of profits.

Both on the factory and on the exploitation you will notice that there are stringent provisions as

4

to the creation of Negotiation shares of founders, amortisations and all the indirect means by which the value of our interests could be diminished.

Regarding the change in the terms of contract as now sent and those cabled you from Milan. As signed in Milan ~~we~~ the experimental Company was to continue 3 years during which time ~~the~~ royalties were to be paid the parts in other companies being given only at end of the 3 years. As now under

[ENCLOSURE]

5

consideration the Agreement Co lasts only one year and we abandon the royalties.

We think it doubtful whether the charge of 25% of total share capital & in all increases is not too heavy; and it is probable that in the final discussion of the contract, we shall be prepared to make it only 20% and to give 20% of that back as commission, leaving 16% net to Cie Continentale.

~~The~~ We invite your attention

6

to the following considerations which have influenced our action on all the contracts now pending, and which are at the bottom of all recommendations made to you regarding such contracts.

~~You are now~~ The Edisons patents in England are now being disposed of for an adequate sum of money and half ~~the~~ rights in form of founders shares. Any such system outside of France and Belgium is impossible in day of the

[ENCLOSURE]

7

territory belonging to the European company. The Italian cities, if any of your directors will confirm who have seen them, are not industrial, are only collection of village population and the expenses of installation will be, (compared with that in English or French cities) very large in proportion to the number of lamps in a system.

Also the consumption of gas is comparatively small. Take Milan for example. With 320,000 inhab

8

there are only 30,000 gas lights burned. Of these 400 are public lights.

Milan is the most gaily lighted city in Italy, and the private lights in other cities bear even a smaller proportion to the public lights. In Naples a large system of petroleum lighting exists in opposition to gas. Coal is brought from Cardiff and the price of gas varies from 32 to 54 centimes the cubic metre. The gas companies have not followed the policy

[ENCLOSURE]

9

of popularizing the use of gas, but of making a very large profit on the small capital employed.

Again, outside of a few cities in Lombardy and Piedmont no industries exist, and the credit and means of individuals or cities is small.

For all the above reasons founders shares in application company in Italy would be conflicting securities for an number of years to come.

The payment of any sums whatever in advance is

10

equally impracticable.

In the contract signed with Leon & Pozzi recently it is stipulated that 4 1/2 % of first capital of all companies formed, on basis of 2000,000 fr. on each 100,000 inhab is to come to new York company, and 4 1/2 % of all augmentations of capital.

In the cables sent you before signature we always proposed 4 1/2 % on a supposed capital of 2000,000 for each 100,000 inhab. and this only. The additional clause for in

[ENCLOSURE]

11

after Bail Jill sick.
It is entirely impracticable and absurd, ~~and ought to~~
The conditions now ~~being~~ proposed in the Italian and German contracts are better than those stipulated for in the contract of Nov. 18. the 45% on augmentation being considered as null.
~~The Bulletin estimates that the sum of 5,000,000 to 10,000,000 fr is necessary for a complete~~ 45% on 2,000,000 for each 100,000 inhab. is about 11% on the total capital estimated for a complete installation of electric lighting in any given case.

12

We take as a minimum in Italy and Germany 15% of the total capital and a royalty of 10 cents additional on each lamp.
We find it impracticable ~~to take out 45% on the first capital~~ either to expect that companies shall be formed with a minimum capital of 2,000,000 for each 100,000 inhab. or that 45% of the sum shall be given to us. But if the light is a success the capital employed in cities

[ENCLOSURE]

13

will be much larger than the above figure, and the interest of 15% on the first capital and on all augmentations, to say nothing of the royalty, is in excess of what was promised to the Light Company, always conditioned on the success of the system.

A careful examination on the spot satisfies us also that we have imposed about the limit that the exploitation can support with any chance of success.

We go further and are satisfied (the success of the system always

14

being assumed) that the plan we are pursuing will give larger results than that followed in England. The district of Lancashire sold for £5,000,000 stg and half profits. Mr. Johnson advises us contains about 2,000,000 inhab of cities. This price gives 60,000 francs, about as advance royalty for each 100,000 inhab.

Supposing that our companies are formed with only 500,000 fcs for each 100,000 inhab we get 75,000 fcs, with participation on same scale in increases, and 10 cents royalty

[ENCLOSURE]

Michael Lamp added,
The character of the Banks
with whom medical is a
good guarantee that the shares
coming to us will be worth
par. ~~[illegible]~~
~~please feed power [illegible]~~
yours truly

[ENCLOSURE]

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLÔME D'HONNEUR

Paris, le 17 Mai 1882

33 Avenue de l'Opéra

Monsieur Sigismund von Kleist

Berlin.

Monsieur.

Nous sommes en possession de vos deux honorées et nous référant à notre lettre du 4 Mars nous avons l'honneur de vous informer qu'un groupe financier vient de se constituer pour l'exploitation en Allemagne de notre système d'éclairage Electrique.

Par conséquent la convention établie par laquelle nous vous accordions une commission de 15% sur les commandes que vous nous transmettriez jusqu'à la formation de ce groupe doit prendre fin dès maintenant.

Nous regrettons que vous n'ayez pu vous entendre avec Mr Rathenau, mais nous ne pouvons entrer dans ces questions personnelles.

En ce qui concerne les 4 installations suivantes;

1° L'Opéra royal

2° Le Café et l'Hôtel Bauer

3° Le Passage dit de la Kaisergalerie

4° La maison attenante à la maison dans laquelle est le café Bauer.

nous vous informons que nous prions Mr Sembel de s'entendre avec vous pour établir les devis pour l'éclairage de ces établissements. Mr Sembel sera de retour dans quelques

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

CAPITAL 1.000.000 FRANCS

Siège Social

GRAND-RUE, 13, BRUXELLES

jours à Berlin et sera lui recommander de vous prévenir dès son arrivé.

Agréez Monsieur nos salutations empressées

LE COMITÉ DE DIRECTION

Administrateur

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 18 May 82

Samuel Insull Esq.
65 Fifth Avenue.

My dear Insull.

Yours of the 26th to hand. Thanks for the 4690 dollars therein stated, with which my account has been debited.

Also let me thank you for attending to that matter of the Seventeen shares, Bailey's stock.

We received today the barrel of armature wire mentioned in your letter of the 28th of April.

I think this wire ought to be packed a little better, that is put a little more paper round it, as two of the rolls, and the paper was entirely rubbed off, and the insulation also on the sides and edges.

I have also received Edison's bill against Seubel for 569 dollars & have forwarded the same to him in Berlin with a request to communicate upon it.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur
PARIS 1881

Ivry-sur-Seine, le 18 May 92

Tell Edison I thank him for the 3500 dollars on English Light mentioned in yours of May 1st. As regards the European bonds I think you had better send them here.

These I shall ~~sell~~ ~~upon~~, as I do not think there will ever be a time when they cannot ~~pay their interest~~.

Yours faithfully
Charbonnelle

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris le May 22d 1882

Thomas A Edison Esq
65 Fifth Avenue
Newyork

Dear Sir,

We beg to acknowledge receipt of your telegram of nineteenth inst.
"Have order for eight two hundred and fifty Light Machines will be shipped about three weeks. Edison".
In our telegram of inquiry we asked when you could give us ten more and at what price. We suppose that with increased facilities for manufacture you will be able to quote us a price below that of the first machines of the same type.

Allow us to call your attention to this and to express the hope that you will give us the terms most favorable accorded to any purchaser. It is quite certain that we shall have occasion for a long time to come to make very large orders for plant, even supposing our Paris factory to work at the shortest date and in the best conditions.

The orders we are now filling are for pioneer plants in various quarters of Europe, and a considerable part of the material is furnished either at cost price or with very moderate profit added.

We are invited by railway and other important administrations to make estimates for installations, and you and we have a common interest in our being able to make tenders on conditions that secure to us the installations.

We beg your especial attention to this point of assuring to us the immediate advantage of reductions that you may be able to make in the prices of material,

Can you furnish us a price current for all the types of machines that you make?

We desire to order to be furnished at shortest delay possible,

Ten 250 lamp dynamos and Ten 20 or 25 Lamp dynamos,

and to beg that you advise us of the date at which we may expect them to be ready and we will telegraph or write shipping directions.

Do you make one hundred light dynamos, or any other types than those we have already ordered? We beg to confirm our telegraphic order of date of May 16th/82.

" Send Antwerp three samples all new fixtures

and two hundred lamps hundred candles*
and to ask early advice as to date of shipment
and information as to price and duration
of lamps.

Yours very truly
J. R. Bailey

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le

May 29th 1882.

Thos A Edison Esq Newyork.

My Cables

I confirm my cables as follows:—

May 12. "Where are rocket screws"—

May 18 "Have lamp screws and caps where are rocket screws"

May 19. "Porges strongly objects Bailey and I will vote it through meeting before next Saturday"

Your Cables

I acknowledge your cables as follows:—

May 18. "Shipment 5000 caps 5000 screws adorsed letter April 18 price lis 2 conductor $2.25 per foot two and half $1.85 three 80¢ Wuesi mailed full details require immediately $5000 account big dynamos. $4500 June first and fifteenth July first and fifteenth

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

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Ivry-sur-Seine, le

Balance early in August get Soc. Elec Edison authorize Wallerstein make these payments will get along with less if possible see letter april 26."

May 19 " Screws from Bergmann shipped Amerique 26 april "

May 23. " Lube works Frenchman asks $125 per month make offer years engagement "

May 29. " Mailed accounts balance against Societe Ind. et Comm. Edison $2500 "

Money sent As regards the money advanced and also the orders given you must never be surprised if we dont quite come up to your time as I can assure you

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

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that all orders given and money advanced are enormously objected to by our friend Borges they are after much difficulty talked into him — As regards the particular payment requested in your cable of 18th we have arranged that you can draw Fr 40,000 and of course by that time you will have turned us something in and we shall let you keep that much ahead — We have sent you an order again for 10 250 light dynamos. and you have telegraphed that you will deliver in three weeks some — I do wish you would keep me posted in such small matters as no of resolutions size of pulleys of any thing new like

250 light Dynamos.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON.

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

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this for it is very embarrassing to have to acknowledge that he really knows nothing about it especially when you have said that you had some almost ready to deliver — I have places to put them all over Europe and could have had the shaftings put up ready but for this —

Patents: I received your letter on patents and will answer it more fully in a few days at present I want to know (a question I have asked once before from Eaton without answer) how does this company stand in regard to the patents in Electric Railway —

You say that you particularly request to pay yourself for all Railroad

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'Honneur PARIS 1881

Ivry-sur-Seine, le

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patents that Dyer may order taken out — Please notify Dyer to send all those to me and I will pay the same myself for you — I notice that Set 12 which relates to N.H. has only been taken out in France — Do you want it taken out in other countries? I think there is a large field for it in some countries in fact I have a man who wants to build a line of about 2 miles and save 12 horses work cutting wood to his mills, the stationary dynamos being run by turbines — I have no doubt this man would take out the patents and do everything for Russia — Under any consideration he wants to make one himself Yours "Batch"

Excuse the Office as Secretary of Present and I am for a few minutes not accep to write —

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SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Machina

Ivry-sur-Seine le 4 février 1882.

Thomas A. Edison.
65. Fifth Avenue New York

My dear Edison,

I think you ought to grind the brushes you send out to the shape of the commutator as it is almost impossible for a man not acquainted with it to file them without spoiling them also if we supply new ones the people themselves will not do it: the consequence is the commutator gets cut all to pieces. I shall grind all here - but I shall still order a great many from you that I shall never see as they go to different parts of Europe.

I confirm my cable of to day as follow:

"Will give adaptation man banks month one year passage both ways cabled

beauty and drawings ambuscade analizing
heavy commutator copper write on hundred
candle lamps &c.

Also in this letter I acknowledge
the receipt of the statement of cost of material
used in large dynamos (C) received from
Mr Rocap of the Edison Machine Works.

Yours
truly Jones.

Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

IVRY-sur-Seine, le 5 June 1882

Thomas A. Edison Esq.
65. Fifth Avenue.

My dear Edison,

Please send me a piece of copper from all the different sizes stops that you use on the big machine, the 250 light machine and any other machine that you make and send them to me as samples.

I will also impress in your mind the necessity of my having drawings complete for the large machine. If you compute and use these drawings complete please send me the first machine you build then will be no changes for I with little men a big shop & many patterns made, as the 250 light machine

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

IVRY-sur-Seine, le

I see that you have shipped Johnson three of them, so do not fail immediately to supply me with those drawings. I know really nothing about this machine except that it is 3 L dynamos together, but as to what speed or how driven & general dimensions I know really nothing. You cannot give me too much information here.

I have sold 4 - 250 light machines here to one man and to day I cannot give him the information that will let him put up his countershafts.

Truly yours.

Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON
Société Anonyme, Capital : 1,500,000 Francs

Ivry-sur-Seine le 5 June 1882.

Samuel Insull Esq.
65 Fifth Avenue. New York.

My dear Insull.

I had the Banque Centrale cable Edison $3000 more in answer to his cable that there was $2500 due from the Société Industrielle Edison.

I have also arranged that the bills for cables have gone through just the same as the others. I got your cable about advance in European but I have been so busy that I really have not seen anybody on these matters for a month & dont know how people feel about it here. I will look round again now.

Yours truly
Chas Batchelor

Berlin, 20. 6. 82.

242 SW. Friedrich Strasse 242.

answ. 19th July 82

Dear Mr. Edison!

Being still without answer of my writing of the 7 of May I have the pleasure to inform you that by the last lettre I received from the Parisian Company (17 May 1882) it is decided me to have nothing to do any more with the company because the financial groupe for the exploitation of your patents in Germany was constituted. A short time

before I received that letter I learned by Mr. Rathenau himself that the financial groups would not be formed this year. I do not know whom I shall believe. Those 4 establishments about whose the letter mentioned will not be lighted by Edison lamps and so it came as I told you the other day that I worked 8 month for the Edison-Company without any indemnification. Therefore I repeat my polite request you to be so kind to compensate the great injustice of your representers and to send me a small indemnification for all my working and waiting. But I shall tell you, lest you cannot form you a wrong idea of my truth, that Mr. Bailey paid me in Paris last year, 12,00 Mark = 400 Dollars = 1,500 Frank for the 7 long special articles I published expressly for him in the first german papers, and 600 Mark = 100 Dollars = 500 Frank for my working and staying in Paris during 4 weeks. I beg you to judge yourself whether that sum can be regarded as a sufficient

Indemnification for my working during 8 months and for all the loss proceeded to me by the action of the company. Perhaps that I have the pleasure to come over to America this winter when I shall have the honor to make your acquaintance and to see that gentleman and great sage whom I admire and respect.

Believe me, Mr. Edison, I remain

Very respectfully
Yours
Sigismund von Kleisz

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THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 20. June 1882

Mark

Mr. T. A. Edison
Menlo Park, N.J.

Dear Sir —

The drawings of C dynamos were sent to Mr. Batchelor by Wells. Fargo & Co Express per Steamer Wednesday 14th inst.

Yours &c
Charles L. Clarke
per Burnham

A. M. Cherbuliez,

ARBITRE DE COMMERCE

10, Rue Petitot, 10.

Genève, le 21 Juin 1882

Thomas A. Edison Esq.
Menlo Park N.J.
United States.

Dear Sir

I received your letter from last 28th May, inclosing the requested copy of the agreement between yourself and Messrs Biedermann, Zurlinden & Chabeling certified by the United States Consul in Geneva

I remain, my dear Sir yours very truly

A. Cherbuliez

Answ.

Dear Sir,
I beg to acknowledge receipt of your letter of 21st June with enclosure for which I am much obliged.

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris, le 22 June 1882

Thomas A. Edison. Esq.
New York.

Dear Sir,

We beg to confirm our letter of yesterday and our Cable of to-day which is as follows:-

Send 3,000 A. Lamps Trieste, 3,000 Hamburg 2,000 Antwerp.

Enclosed please find Order for the same.

As you are aware there is about to be a Grand Exhibition of Electricity at "Munich" and we intend to have a very good show within it, to enable us to do so, will you please send without delay to "Hamburg" the following:-

1 of each kind of the 3 different size Water Meters and samples of everything connected with tubing and junction Boxes etc. etc.

We hope as the above is specially for the Exhibition that you will charge us only with cost prices

We also beg to confirm our telegram which we have just sent, as follows:-

Ship Hamburg two Tons Insul wire assorted two barrels 10 July tape, signed "Electric Edison".

Yours very truly.
SOCIÉTÉ ÉLECTRIQUE EDISON
D. F. Bacle
Administrateur délégué

Ordered 10 July tape
59460

File

Berlin. June 25. 1882.

Unter den Linden 40. I

Major Eaton,

V. P. Edison Electric Light Co.

New York.

Dear Sir:-

In compliance with a request of Mr. Batchelor, I take pleasure to make the following communications concerning the lighting of the cellars and malthouse of a brewery. It is about the installation at the "Boehenisches Brauhaus" at Berlin.

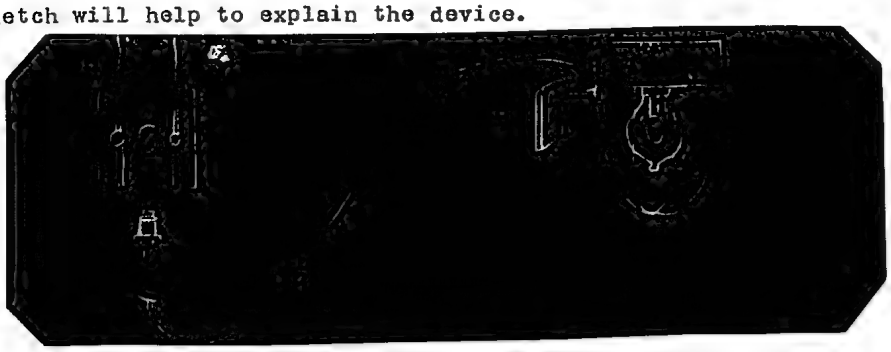
There are three large malt germing cellars which have to be kept at a low temperature and gas as a lighting agent is therefore inadmissible. The sunlight is excluded from these cellars, which are only in use during 8 months of the year, there being no malt made during the summer months. Heretofore only candles were available for lighting. I installed in the brewery an experimental plant with B machine and 120 B lamps which have to be kept in use night and day. Very little light is needed for malting purposes and I have therefore only 15 B lamps in a space of about 1500 square meters of floor surface, or 1 B lamp for 100 sq. meters of floor surface. The lamps must be arranged so as to turn on or off by means of a switch placed against the wall or in the passage way to avoid stepping on the malt. The lamps are suspended from the ceiling in the ordinary way, downwards, without shades, the low, whitewashed arched ceiling making a very good reflector. This mode of lighting has prov-

ed to be satisfactory for all the work to be done in the malthouse.

The task of lighting the fermenting and storage cellars was however more difficult. A temperature not exceeding 4° centegr. must be maintained continually, the walls are wet and the carbonic acid, discharged from the fermenting beer acts on the ordinary insulation of wires; all iron parts in sockets especially so the little screws and rollers on the stopcock should be avoided, rust putting an end to their usefullness within a few days. The plaster part on the lamps must be thoroughly japanned or shellacked lest the dampness, absorbed by the plaster will soon corrode and destroy the little copper conducting wires of the lamp. For main conductors I used the ordinary NO. 10 wire with cotton and whitelead insulation but fastened to porcellain insulating brackets so as not to touch the damp walls, lead covered double conductor cables being used for branches running to the lamps.

I will now describe the kind of lighting and the special fixtures needed in the fermenting cellars. A few B lamps were placed here and there for general lighting of the passages. Then there is a necessity for an almost absolutely portable lamp as the light is used all over to replace the candles. The most important operation in the fermenting cellar is "tub washing" a job requiring great care and a good light These tubs fill the whole cellar and are mounted about four feet from the floor with gang planks between them. To make our lamps suitable to all these different requirements, I placed our ordinary square cut out cleats somewhat modified in small cast iron boxes, provided with a door with rubber packing, in sufficient numbers all

over the cellar, a proper distance apart. The rubber packing is to keep dampness from the contacts while the connection box is not in use. Six lanterns with a B lamp in each were made for each cellar and a stout rubber tube 5 or 6 meters long by 5-8 inch outside diameter with good flexible double conductor inside was attached to each lamp; the end which is connected to the above mentioned cut out cleat is provided with a modified form of our ordinary cut out plug, by means of which the conducting cord is attached to the connection box. It is essential that the rubber tube is well cemented in the long wooden handle of the plug and also well secured at the lamp so that no strain will be on the conducting wires themselves but only on the tube. The sketch will help to explain the device.



The lamp is provided with a hook so that it can be hung on the tub. The socket is surrounded by a tin collar so that the lamp can be reversed and set on the floor for washing the bottom side of the tub. Two stout iron wires soldered over the lamp form a guard against breakage. These wires must be far enough apart so as to admit of an exchange of lamps. Whenever a workman needs light in any part of the cellar he attaches a lamp with conducting cord at the most convenient connection box. This mode of lighting met the approval of the cellar master and the Director of

the Brewery.

For the storage cellars similar connection boxes are used but here it is necessary that all the boxes should be sunk in the brickwork so as to be out of the way in putting up or taking down the large barrels. There is a middle passage in the storage cellars to the right and left of which are a number of sub-divisions called "sections." The barrels are stored in 7 tiers and built up three high to the ceiling. Light is used for 2 different purposes. First for laying in and filling the empty barrels. For this purpose 4 B lamps were fastened on the ceiling of the "section" with a good reflector. These lamps are on a switch alongside the door in an iron box sunk in the Wall. The second purpose for which light is needed is for drawing off the beer into small casks. The lighting is done in a similar manner as in the fermenting cellars only one lamp being used at a time in each "section." Four connection boxes are placed at the side of the cellar, having a box between every other tier of barrels. The shape of the lantern used here is the same as the one described above but an iron screw clamp is attached to it opposite the hook so that it can be screwed against the head of a barrel for tapping. All the conductors inside the section must be covered with lead and sunk in the wall as the brickwork is occasionally washed off with dilute sulphuric acid. Ordinary drop lights are used in the passage but as these are also laid full of storage barrels 3 times a year, it is necessary that they can be easily removed and I intend to use a cast iron connection box on the ceiling

into which the rod, carrying the lamp, can be screwed in a similar way as our out out plugs.

I also desire to make a few remarks about a shade which I used in the Printing house of the "Boersen-Courier" on the compositors cases. The shade is not open above as usual but is attached directly to the socket. It is made of tin <u>painted white inside</u>. It gives very good results and makes all the light available, a B lamp being quite sufficient for each man with this shade.

Hoping that some of these points will be of interest to you, I remain,

Yours very truly,

Ph. Seubel.

1882-06-26

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'Honneur PARIS 1881

Ivry-sur-Seine, le June 26 1882

My dear Edison,

Your numerous cables on details of machines to hand relieving our minds greatly; You cannot give us too much of this information — Your letter on factory also to hand and contents digested —

I am sorry there should have been so much trouble about those payments on the large dynamos. These people are very different to Americans or even Englishmen and it is necessary to work them in their own way — I find it a little difficult to get their full confidence until we have something to show them here. If I could have put up a couple of machines here like Johnson did in London there would have been no difficulty — We are getting up some good plants in Europe but we have not a single installation in France and shall not have until I make it here

As regards the advances made of $5000 and $9000 they wish it understood that these payments are to be applied on the first two large dynamos and only them. When you want an advance

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1,500,000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

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on the second 2. you must make a special demand for it and I should advise you to make that demand immediately in order that these two machines may be commenced and we shall not have to wait for them

Of course all 2 dynamos and 200 lights you collect for immediately they are finished — There will be no more trouble like this if we can get a really good installation up somewhere — I suppose you are worked to death just now — I would give a great deal to be at the starting of the New York station — My job here is no fool of a job what with lamps, dynamos, chandeliers, and all the extras, I am just in up to my neck; then I have so much outside work of such a responsible nature and involving so much money, that I wear a hat about three sizes larger than when I left New York —

Yours "Batchelor"

Ans 19th July 86

CIE CONTINENTALE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Paris 1881

GRAND DIPLOME D'HONNEUR

Paris, le June 26th 1882

Thomas A. Edison Esq.
65. Fifth Avenue Newyork

Dear Sir:

We find the prices of the I dynamos very high: so high that there is no business for us in ordering them, and we can order none except where forced to do it for some special reason. When Bailey was at Amsterdam he found that the Siemens plants are offered in trade, complete (plants of 60 a. lamps) at 3400 fcs. all accessories included. We pay you $575. in Newyork, so that by the time the I dynamo is free from the Custom House in Antwerp; it has cost the price of an entire Siemens plant.

We have been obliged to engage to give small plants for Holland, until our factory turns them out, at cost price, (to us) The Paris factory will not be able for a long time to furnish the quantities of material that we have need of. Can you not with proper regard to your own interest give us terms such that we can afford to order from you in the large quantities that we have need of? Can you not give us a price of about four hundred dollars for the I machine; and on all the types of machines a discount, special, that would make it possible for us to make some profit and to allow the necessary

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discounts, We recommend to your consideration this subject.

Yours very truly

Peter Bailey

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Encl.

File Gouraud Contracts

Thomas A. Edison Esq.
New Jersey.

6 Lombard St. E.C.
London. 30th June 1882.

Dear Sir,

I herewith enclose Copy of a letter received from Mr Bailey, about which I will see you when in New York.

Yours truly,
G. E. Gouraud

[ENCLOSURE]

Copy.

Paris, France.
33 Avenue de l'Opera.
May 20. 1882.

Personal.

Colonel George Gouraud,
6 Lombard St,
London

My dear Colonel,

Enclosed herewith please find reply to your letter of yesterday about Edison companies on Continent.

It occurs to me that the Company you are preparing to bring out is probably for European Countries in which Mr Edison has no Patents.

Probably you are not aware that the Cie. Continentale of Paris not only holds all the Edison Patents for the Continent, but also is the Concessionaire of the Edison Electric Light Company of Europe (Limited) of New York, of all its rights in Countries not covered by Patents.

The Cie. Continentale, which numbers among its Shareholders a large number of the first bankers of Europe, is arranging for the establishment of extensive factories on the Continent from which to supply a real exploitation of the Countries in question. It has had under consideration for some time the formation of a Company for these Countries, and naturally would not be an indifferent observer of any movement in the same direction. Would it not be better that conflicting interests should be arranged between the parties concerned than to take them before the public.

I make suggestion as a matter purely personal between ourselves, that we may not engage any other people on one side or the other unless we are agreed.

Yours very truly, (signed) J. F. Bailey

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July 16, 82

Ichl

Paris

July 16th /82

Thomas A Edison Esq
My dear Sir

It will no doubt be a great surprise to you, to learn that I still live, when you consider that I am linked into this french ring. However such are the facts, and from them you can interpret my views of the situations. Perhaps later on it will be necessary for me to detail matters more, but at present I shall confine and limit myself to the above few words.

I am at present engaged in the pump room getting things straight. I have already started the Plat=

ing and socket rooms, and ~~[illegible]~~ go into the testing room. We finished some lamps on the fourth of July and the lamps we make so far we use as resistance lamps. The first machine works pretty well so far, although we have not made it do hard work yet. I long to be back again at the park, and resume experimenting.

Hoping you will let me know when I can expect to be recall'd

I remain Yours sincerely

Duncan

CHAS. BATCHELOR,
~~52, Rue de la Bienfaisance~~
CABLE ADDRESS
Batchelor PARIS

Paris, le 188

17 July 1882.

My dear Edison,

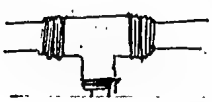
I confirm my telegram to you last night for 5000 bulbs and enough glass to make all complete 5000 lamps — I have struck a "bug" which I am sure is in the glass — I have not confined myself to one manufacturer but have got samples of three of the best makers here — The bug is this :- One of the wires in the inside part- becomes black in the inside of glass — it is always the same wire as if it was an action like a plating action — I have tried for it in everything and I think it must be in the glass I therefore ordered the 5000, if I find it is something else we can always use the glass. I have had a great ~~at~~ deal of trouble with the glass men here and when I have got them just where I want them I have struck ~~this bug~~ they are making me different lots now —

lamps

You will find out if the platinum wire is in the glass or not if you make a few lamps without platinum wire in them

Dynamos. I have finished 6 Z dynamos and have 28 more almost finished I have 100 more well under way — I have started 2 big dynamos and I want you to tell me which engine I must use an order for them I will send officially — Wenning Co + Simm 175 hp going up to 250. price in about 1859 @ 1875

Mercury tubes leakage — You know at Menlo Park we had considerable difficulty with leaky mercury tubes — I have struck a thing here that has just killed all that trouble — In all my tubing for 600 pumps there has never been the slightest leak. It is this :— I put no washer under the flange of mercury cock but screw it in to within a 1/16 inch of shoulder and then I lap fine fish



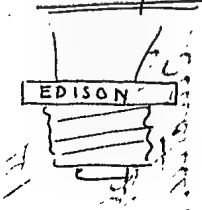
CHAS. BATCHELOR
52, Rue de la Bruyère
CABLE ADDRESS
Batchelor. PARIS.

2 Paris, le 188

Send John Grant copy

cord round it to fill up the gap - after this is fastened tight I soak it with shellac in alcohol and when this is hard + soaked in it makes a most perfect mercury joint —

Socketing moulds. I have cast all my socketing moulds of type metal and they work very well when the plaster comes out of moulds they have the name on as EDISON on one side + Brevetté S.G.D.G. on other deep in plaster



Safety Catches = I have made all my safety catches of plaster of paris and I think they are cheap I believe you did this once but I dont remember why you did not use it — Was it too dear? I put a piece of glass tubing over the wire as as to have a big hole —

Send the Engineering & Mining

Screwing bolts = I made a good strike here in the shape of a Brown screwing machine for bolts I have not cut a thread on the dynamos the Keeper bolts + steel head screws I cut in this machine at one cut — It takes my man just 4 minutes to finish a Keeper bolt with a beautiful thread at one cut I do everything on it from the pulley screw up to the Keeper bolt - I make the belt tightening screw at one cut ~~#~~ without any turning

We have the large Bolt & nut 1.28 long cut with belt and 1 not

Let me know your opinion on some of these things

Yours

Batchelor

Should like to have about 1 nights talk with you have not time to write much B.

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

NUMBER	SENT BY	REC'D BY	CHECK
6	A	C	16 paid

Received at Menlo Park Depot 7/19 1882

Dated New York 6 30 pm

To T A Edison

Italian contract incomprehensible board decided to do nothing till Bailey comes shall I call board together

A B. Eaton

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SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Batchelor

Ivry-sur-Seine le 22 July 1882

My dear Edison

Will you kindly have someone answer these questions and return?

What is weight of } I, R, and 150 light
" " length " } " " Dynamo
" " width " } —
" " height " }

What is resistance of all; magnets and armature?

What is the diameter & face of all their pulleys? and what speed do they run?

Why do I not get drawings for 250 light machine when you have already sent me 8 to different parts of Europe?

What is the size of carbon for 16 candle lamp?

What is size of carbon for 32 candle lamp?

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Ivry-sur-Seine le

2

What size of wire is used on 250 light machine? Coils + armature — all particulars?

I am badly in want of lots of little particulars.

Yours
Batchelor

Meter Chart
Blower
Steam Pipes
C. Dynamo
Circuit Breaker
Tables

D 1882 El. Lt.

Milan Italy August 1st 1882

Mr T. A. Edison

New York

Dear Sir

Tomorrow Prof. Colombo of Milan in Company with Mr Baily, starts for New York.

I hereby take advantage of the kind offer of the Prof. to deliver any messages I wished to send.

It is quite possible I will be in New York in from one to two months. Such being the case, can I obtain an agency for your light in Pennsylvania. I have in that state many influential and moneyed friends, especialy in the western part.

The business throughout Europe looks very well indeed although even yet the Electric Light wave is but just started; at full tide it will be of mammoth dimensions.

It would be useless to enter into details as Mr Baily and Prof. Colombo can more fully in all the colors.

Very Respectfully

E. G. Acheson

Mr. Edison,

The enclosed letter from Puskas & Bailey has just been received. I send you a copy thinking you may feel interested in what is going on. Please do not trouble yourself to either acknowledge this ~~letter~~ memo. or to return the enclosed copy.

S. B. Eaton

August 3rd. 1882. per Mc.G.

Paris, July 17th.1882.

33 Avenue de l' opera.

Major S. B. Eaton,

Second Vice President.

Dear Sir:-

We did not send you copy of contract made in Holland as Bailey had the intention to leave for New York before this date. It was necessary that he should go to Italy, from whence he returned Saturday last. His colleague, Mr Rau, is ill at this moment and Bailey cannot leave till the 5th. prox. for which date he has taken passage on the "Arizona." He will bring with him copies of the Holland and Italian contracts. For the moment we only give resume of conditions of these contracts.

HOLLAND. We get fifteen per cent of profits in central stations (per?) lamp on lamps employed central stations, and ten per cent on invoice price of all apparatus furnished for installations isolees.

The Holland company obliges itself to buy all articles from us, and we engage to sell only to it for that country.

Acheson is in Holland for several days past, making installations and also preparing plans &c., for central station at Amsterdam.

Herewith please find copy of notice of first lighting up of first plant at Amsterdam.

ITALY. We have had a long delay in this business, which was brought to a close by signing of contract the 10th.

inst. conditions of which were cabled "Edison New York" from Milan. The Italian syndicate is formed with a limit of duration up to 31st. Dec. 83. It has a capital of 3,000,000 francs commencing at once a factory and a central station at Milan. Batchelor leaves here the 24th. inst. to make plans and arrange for these two affairs, and also for a contract for lighting up Udine. We have several installations now working in Italy and will send for certificates. The conditions of contract are (1) fifteen per cent of total capital of formation, and of all increases during 20 years. (2) royalty of 30 centimes on all lamps - employed whether in central stations, or small plants. (3) Royalty of ten per cent on selling price of all material employed in installations isolees. At present the intention is that one company shall carry on the manufacturing and exploitation. If a separate company shall be formed for the manufacturing, we have half the profits, the same as in the Paris factory. The signers of this contract are the Bank General, the Credits Lombardo, the Banque de Milan, the Credit Italien, and Prof. Golombo. Amongst the persons in the syndicate are the Banks of Rome, and of Naples, the Credit Mobelier Italien, and the house of Pacifico Cavalieri of Ferrare and many others, embracing the principal financial strength of Italy.

Bailey wrote to Major Garbi before signing the contract inviting him to meet him at Bologna to arrange (1) that he (Garbi) should be admitted for say 100,000 francs of the 3,000,000 subscribed, as one of the founders of the Societe Italienne. (2) that he, or his son-in-law, should be the representative of the

company for central Italy. (3) that Major Garbi should accept to be named as one of the Directors of the Italian Company "Continentale." Major Garbi's health would not allow of his accepting the invitation to come to Bologna, he being at the seashore and his physician not allowing his coming into the interior. Bailey therefore wrote him fully confirming the above to which there has not been time to receive reply.

Very truly yours,

Puskas & Bailey.

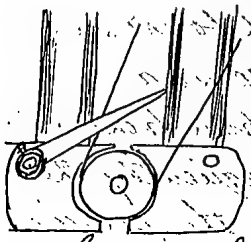
9

SOCIÉTÉ INDUS.elle & COMM.le EDISON

Société Anonyme. Capital 1.500.000 Francs.

Grand Diplôme d'honneur PARIS 1881

Ivry, le 5 August 1882



My dear Edison

I have sent away now about 18 L dynamos — I have found it a good thing to have a guide for the belt so I put one on so — it is made to go on either side or on top or bottom whichever way the belt comes. In some installations it may not be necessary but in others particularly those exposed to the air the change of atmosphere to very damp slackens up the belt very much and the belts will wobble so much that they are in danger of cutting the armature —

In some of the mills I notice that they are not at all particular how they connect up the belt and consequently they wobble very much.

Switchboard My switch boards I have made so as everything screws on from front I have noticed that frequently these machines are put in the engine house and in time the wood dries out and leaves the bind-posts & everything loose and you have to take it off to fix it I have put my bindposts on so and every thing else except the swing lever stud which has a nut on top

SOCIÉTÉ INDUS^elle & COMM^le EDISON

Société Anonyme. Capital : 1.500.000 Francs.

Grand Diplôme d'honneur PARIS 1881

Jersy, le 188

3

Armature plates

I have persuaded a man here to make me these under a steam hammer in a mould and they come out bang up as true as if they had been turned — he charges me 90 Fcs for 100 Kilos which is 8½ ¢ per lb All I have to do is to bore the hole & put them on the shaft — they guage as true as if they had been turned ——

Name All my heads are marked by letters cast on so and sticking out about ¼ inch the other side is Soc Ind et Com Paris. etc.

I have just got my tools for the socket finished I have had to make the male & female screw for lamp and socket and they work well

I have got 50 Kilos of wire now for armatures wound beautifully with 6 wires together — I have had a great deal of trouble to get it so that it is as well insulated as the other we use but I think I have got it — I will send you samples — I believe my boys will wind armatures twice as quick if it is all right

Yours

Ratchetor

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company TRANSMITS and DELIVERS messages only on conditions limiting its liability, which have been assented to by the sender of the following message. Errors can be guarded against only by repeating a message back to the sending station for comparison, and the company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages, beyond the amount of tolls paid thereon, nor in any case where the claim is not presented in writing within sixty days after sending the message.

This is an UNREPEATED MESSAGE, and is delivered by request of the sender, under the conditions named above.

THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	RECD BY	CHECK
1	aw	C	16 Collect 1 Sx

Received at Menlo Park Depot Aug 6 1882

Dated Paris Via NY 6

To Edison NY

Edison NY. Send quickest Hamburg tea regulators & Electric & Burry Expedition other orders

Get pers. Es from Clarke

Bill regulators Carpet & oil

Note. Brach must see Clarke & have him accelerate them

Electric

Es machines are shipped to testing machine without fail

46

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Batchelor

IVRY-sur-Seine 13 Aug 1882.

Thos A Edison Esq
65 5th Avenue
New York.

My dear Edison,

I confirm cable Aug 10 as follows:-

"Send bamboos quick"

& acknowledge yours in return of 12th as follows:-

"Fibres shipped"

Have you taken steps to put me in communication with the Japan firm for getting these direct if not please give them an order for 1/2 million at once

Yours Batchelor

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THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY	CHECK
1	Zx	E	11 Paid 33

Received at Menlo Park Depot. Aug 14th 1882

Dated New York 13

To T A Edison

Menlo Park

Shall I find you home Monday afternoon answer Fifth Ave Hotel

J F Bailey

Filed in N.Y. 830pm 13th

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THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY	CHECK
2	Mo	E	31 Paid

Received at Menlo Park Depot August 21 1882

Dated Dunellen N.J. 7 Pm

To Insull

Menlo Park

Will drive to Menlo Park tomorrow morning before nine Meeting for N.Y. to go in with Edison if going by earlier train telegraph on receipt this otherwise all right no answer required

Bailey

Send immediately one Deprez Galvanometer for Edison

SOCIÉTÉ INDUSTRIELLE & COMMERCIALE EDISON

Société Anonyme Capital 1500,000 francs

Memorandum

~~PARIS~~, le Ivry 22 August 1882

M. Mr. A. Edison

New York.

Ever since the Exhibition I have thought of using the Deprez galvanometer for testing lamps I have had mirrors fixed on them and we find absolutely no difference between them and the Thomson Galvanometer in point of accuracy — The spot goes right to its place instantaneously and you can test very quick — I have had one working for Electric M. F. now for the last week and every lamp has also been tested by Thomson & Electric Dynamometer and it has not changed at all Yours Barthela

When Roland was here he ran this down as an unscientific instrument but I find it eminently practical C.B.

Aug 22.61

Baltimore

Ans 27th Sept 82

6 Lombard St.
London, Eng. 22nd Aug. 1882.

My dear Edison,

I have had to-day an interview with an English gentleman holding large properties and immense water power, in neutral territory between France and Switzerland, who is prepared with his friends to find money to test the question of power delivered at Geneva, 15 miles from the source thereof, if in your opinion the transmission of power to the Dynamos can be economically effected under the following circumstances:—

1st The water power is that of the Rhone at Bellegarde, where after rising from the Lake of Geneva, a pier and reservoir have been constructed with turbines capable of delivering 10,000 horse power.—

2.° These works cost £257,000, and are at present comparatively useless. It is contemplated to utilize them by delivering at Geneva and Lyons by means of electric cables 10,000 to 30,000 horse power as required.

It is stated that —

1st The existing turbines are capable of supplying 10,000 HP and additional ones could be availed of as required to any conceivable extent.

2nd A concession to light Geneva if successful can be obtained.

(2)

Now what is wanted of you is this —

A To express your opinion as to whether in the existing state of science as to electric conductors, a station can fairly be — calculated on, as likely to have delivered to it, such a percentage of the power supplied 15 miles off as will be commercially valuable. In this view it will enter into your calculation that the question has to be considered against the cost of £23 per HP, for power — developed by steam at Geneva, the station referred to.—

B. As to the size and weight of conductors you are asked to state your opinion as to what you would consider sufficient for transmitting power to be used 15 miles off.

C The calculations might be taken on the transmission of 10,000 HP.

The experimentors state that they could get £20,000 subscribed to a Syndicate to carry out the experimental scheme if you consider it feasible.

As the expense would be considerable in any case it would be desirable to recommend the laying of such a cable as at a minimum of expense would test the question, and yet form a basis for larger operations if the experiment

was

was successful.

To sum up the main points are:—

1st. That already Machinery for the transmission of 10,000 HP exists.

2nd. That from the enormous volume of water, this quantity may be looked upon as absolutely constant both winter and summer.

3rd. That the owners are willing to lay the Cables at their own risk and expense.

4th. That they thoroughly believe in you and your system.

5th. That all they want is to have your careful and candid opinion as to the possibility and probability of success.

6th. That it is (in their opinion) known to you pretty nearly from your work at New York, how far Electric power can at present be transmitted economically.

7th. That this is no mere attempt to get an opinion from you, but is from responsible people ready to spend their own money, and push ~~8th~~ both Electric Light and power.

8th. That before doing so, they desire to be fortified with your advice and opinion & to have the benefit of your experience.

9th. That the Edison system is what they propose to exploit in Geneva, and if successful there then to attempt it at Lyons 70 miles from their turbines. — I shall be much obliged if you will give this matter your immediate attention. Yours faithfully,

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

4

Columbus

File

New York, 23 August 1882

Dear Sir

As it has been stipulated between the Compagnie Continentale of Paris and the Edison Syndicate of Milan, that the Comp. Continentale will deliver to the Milan Syndicate the machines and apparatus for electric lighting at cost-price, viz. at the same price that the Comp. Continentale pay to Mr Edison, I should feel very much obliged to you if you will forward to my address, Fifth Ave. Hotel, Room 291, a list of prices for Dynamos, lamps, regulators &c. Mr Clark told me that this was a particular

business of Mr Edison and you,
because the Edison Co. in New York
have nothing to do with the spe-
cial arrangements between Mr
Edison and the Paris Company.
I have been particularly requested
by the Syndicate of Milan to send
them the required price list,
in order to be able to make
estimates, which they cannot
do now with the necessary
exactitude.
I beg pardon for the trouble
and remain with the best
thanks.

Yours truly
G. Colombo

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

NUMBER	SENT BY	REC'D BY	CHECK
1	Wu		26 Paid

Received at Menlo Park Depot Aug 26 1882

Dated, Dunellen Aug 26 1882

To Insull

If Orange City today call if possible number sixty five before midday otherwise will come Menlo before nine twenty train ~~tomorrow~~ Edison wont leave earlier

Bailey

SOCIÉTÉ ÉLECTRIQUE EDISON

SOCIÉTÉ ANONYME

Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

Paris the 25th August 1882

Th. A. Edison Esqr
New York

Dear Sir,

We beg to confirm our respects of yesterday.

The Italian committee who took our stock in Naples sent one of their clerks in whom they could have implicit confidence to verify the contents of the cases which were unopened.

Enclosed a list showing the differences they found & you will therefore please credit us for the amounts for

40 a. lamps
20 sockets with keys
10 cut offs
50 plugs

50 small cleats
10 clamps
5 brushes

being articles you invoiced to us & which were not in the cases.

Enclosed we beg to hand you a letter in German with an English translation showing the modifications

introduced in our contract for Germany.
We have approved these modifications
& now require your approbation which
kindly send us without fail by return
of the mail.

Yours sincerely

SOCIÉTÉ ÉLECTRIQUE EDISON

Administrateur délégué

Compagnie Continentale, Paris.

New York August 26th 1882.

Thomas A. Edison Esq.

Dear Sir:

We are desirous of making an order for lamps of one hundred and of fifty candles. Will you kindly advise us at what date you can make deliveries of such lamps and at what price you would make orders for one thousand of each class.

Your attention is specially invited to the subject of the immediate preparation of these types of lamps inasmuch as the demand for them is very frequent and very pressing in Europe. We have already taken orders for these lamps for several of the plants that we have contracted to deliver during the coming month.

On all sides the persons with whom we have made contracts desire to have such lamps or to serve themselves with an arc lamp. If you can put us in a position to furnish the lamps of the above-named types immediately, you will do a great service to us and will advance very much the application of your system.

We remain,

Very Respectfully Yours,

F. R. Bey

Administrateur Delegué.

Answered Aug 31 1882

Compagnie Continentale, Paris.

New York, August 26th 1882.

Thomas A. Edison Esq.

Dear Sir:

Referring to the subject of orders of the material for the Italian Company, we beg to say that it seems quite necessary that all orders should come through us rather than directly from the Italian Company. The same observations will apply to the case of all orders that may come to you for execution from the territory for which we hold the patents. Otherwise it will be impossible to exercise any control over the business. We beg therefore that, in the case of the receipt of orders from any parties other than us, you refer the letters to us, advising the parties that all orders must be filled through us. We beg to remain,

Very Respectfully Yours,

F. F. Bailey

Administrateur Delegué.

Answered

Aug 31 1882

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THOS. A. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY	CHECK
5	P	C	H Paid

Received at Menlo Park Depot August 28 1882

Dated Dunellen N J 28 1882 7 10 pm

To Insull

Will call about nine

Bailey

New York August 29th 1882.

Thomas A. Edison Esq.

Dear Sir!

Referring to our conversations concerning the material used in the Paris Exposition and at the Crystal Palace for your miscellaneous Exhibit, I beg to request that you will cause it to be shipped to Munich via Hamburg by the first opportunity. The expenses will be paid by the Compagnie Continentale which on the expiration of the Exposition will reship the same, expenses paid, to you at New York.

I Remain,

Very Truly Yours,

J. M. Bailey

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

1

New York, August 30 1882

Mr. Thomas A. Edison,
My Dear Sir:

Will you please advise me about the automatic regulators. I have just received a letter from Paris saying that since it was written, it is about four months ago, they have heard nothing regarding them, and the twelve ordered have not been received.

They are also very urgent regarding the 100 candle lamps. I have met Mr. Upton this morning at No. 65 and he says that he doubts whether deliveries of good lamps of these types can be made in less than two months. I beg to confirm my previous letter of Aug. 26th and repeat to you that it is of great importance to turn out these lamps at the earliest date possible with reference to replacing the arc lamps by them. It would

be very desirable also that some of them should be shown at Munich and at Brunn on the occasion of our first lighting.

Mr. Upton thought that some of the 50 and of the 100 candle lamps might be turned out in five or six weeks but without guarantee as to their life.

Can you not turn out on these conditions say fifty of each in time to ship them express for the opening of the Munich and the Brunn lighting the middle of October next?

Very Truly Yours,

J. F. Bailey

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THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	RECD BY	CHECK
2	tow	E	10 Collect

Received at M Park Depot Aug 31 1882

Dated Newark N J 31 1045 am

To Alva Edison

Menlo Park

Telegraph Colombo to come to lamp factory this afternoon

Edison

forward to Edison

Paris Sept 1th 1882

Thomas A Edison Esq
My Dear Sir

About one month ago I induced Mr Batchelor to buy a Deprez galvanometer in order to ascertain if the ~~[illegible]~~ had any practicable value for our business, and if so to substitute it for the dynamometers. The dynamometers you know require a great deal of attention such as frequent standardizing, and at the same time the deflections cannot be read in an instant, although you employ a damping Key. The Deprez galvanometer as now constructed consists of only one magnet as shown in the enclosed sketch. This magnet when to strong is short-circuited by a Keyper K, between the poles there is a coil of wire divided into two parts in the center of which is the needle which is pivoted and from which projects a straw indicator on to a quadrant scale. The internal resistance of the galvanometer that I have is about 500 ohms, and with an E.M.F. of about 43 volts on its exhaustion it deflects to the end of the scale. Now in order to read a higher E.M.F. the makers provide two auxiliary coils, each having a resistance equal to the galvanometer, so that if the two coils are inserted in the circuit, the current will be weaken one-third and the deflections indicated by

by the indicator will or have to be multiplied by three. Then again this reduces the sensitiveness of the instrument ~~one hundred~~ three times. This however did not discourage me, as I saw there was some merits in the instrument and if improved could be useful for our work. I took the straw pointer off and in its place substituted a mirror and got a range of about one meter from the scale which is of ground glass, this you see increased the sensibility of the instrument infinitely. I then tested it to see if it would change its zero point and found after breaking the current a few thousand times it did not alter. Then I sent currents of various strengths through the instrument, marking the point of each deflection on the scale, and at the same time ascertaining the E.M.F. by means of the Thompson Ref. Galv. This gave me the cardinal points, from which to construct my scale direct in volts which was done by means of the cross-section paper method. The scale here is graduated from 1 to 125 volts. Having done this I subjected the instrument to a time test, that is to see if it did not alter in any way. We have used it now for one month, and have continually compared it with the Thompson and find it still correct. The beauty of it is that the moment you put the current on,

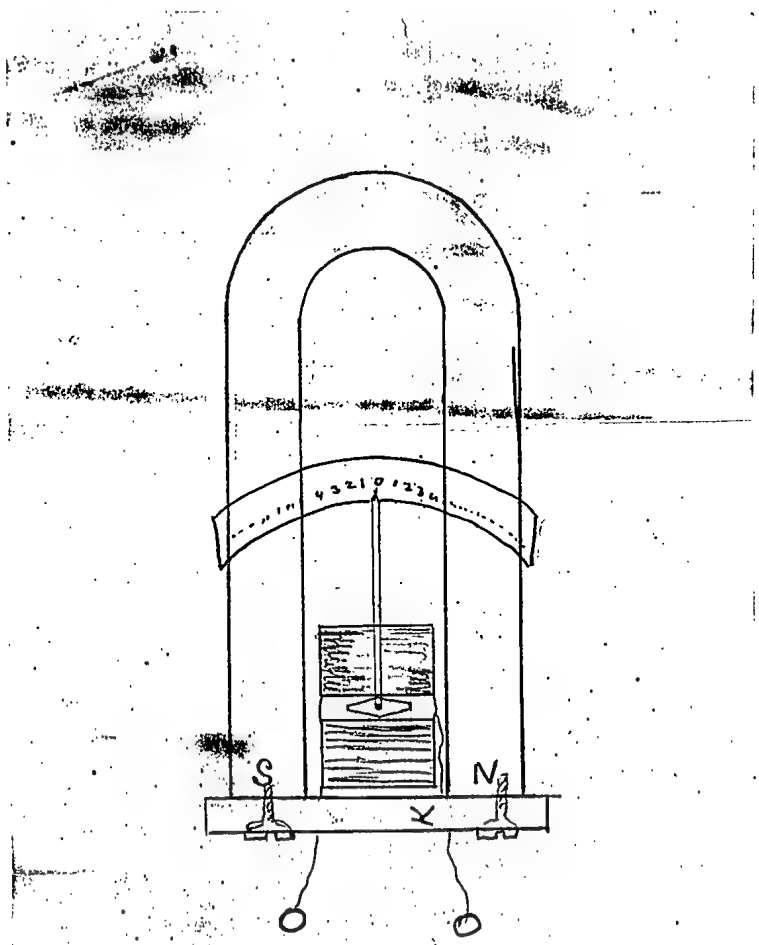
the mirror finds its position direct, without vibrations, and you can read it right off, without waiting as you have to do, in other instruments until the needle or spot of light settles. Then again a great deal of trouble is saved in not having to standardized it every day as you can leave it for a week, a month, and then only look in order to satisfy yourself that it is still right. I tell you one instrument will do the work done by three-four dynamometers. One boy at the galvanometer, can take the readings for three four boys in the photometer room and at the same time keep his standard lamp right. Then again it would be very useful to you in your Central station for the feeders &c. and any place where a Thompson galvanometer is desirable. We do not keep the current on continuously as it is over 500 ohms and small wire but if wished to do so its resistance ought to be increased, using good sized wire to about 5000 ohms. If an instrument is ordered from the maker it takes about 27 day to receive it, as they are only made to order. Let me know what you think of this, and if you would like some. They cheapse 25$ for an instrument.

My position here seems to be a sort of inspector general (dont smile, but rather pity me) as bugs come up

tell the times. I spent a week in Bordeaux getting things at the Exhibition right and straight. I met Bob Cutting there, and his wife. He seemed anxious to learn about the progress in New York. On my return to Paris I found that they received the telegram from Mr. Bell stating that you have been [illegible] telegraph so to Mr. Cutting, but he moved having left Bordeaux for some watering place near Spain. Then there are other places I am looking out for in Paris. Mr. Batchelor has no doubt sent you the economy of the lamps here, being over 10 per H.P. The only thing wanting is their life which at present is short, but no doubt will increase as we go on. [illegible] and I learn that young Mott and his wife was in London and are now in Geneva. They are turning out small dynamo-machines daily now, and are advancing in their socket and lamp fixtures. They have begun to make some of the parts of the large machine &c.

Hoping you are well
I remain
Yours truly
Francis Jehl

[ENCLOSURE]



The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

1882-09-02

New York, Sept. 2 1882

Thomas A. Edison Esq.
Dear Sir:

Referring to your letter of the 31st of August about the Tubes from Milan, Italy, I beg to say that Prof. Colombo has only this morning received the telegram from Milan which allows him to fix on the conductors to be used for the Central Station at that place. Mess. Patin and Picaud are engaged in making the plan for the conductors which will probably be ready by Monday or Tuesday next week. I have already spoken to Prof. Colombo regarding the order and he has agreed to make it official as soon as the plan here referred to shall be completed.

I am,
Very Truly Yours
F. P. Pirelli

Form. No. 3.

CABLE MESSAGE.

THE WESTERN UNION TELEGRAPH COMPANY.

All CABLE MESSAGES received for transmission must be written on the Message Blanks provided by this Company for that purpose, under and subject to the conditions printed thereon, and on the back hereof, which conditions have been agreed to by the sender of the following message.

THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY	CHECK
141	E	6	Paris 49

Received at 946 BROADWAY. 7 35 pm Sept 29 1882.

Dated E

To Edison Newyork 25 Gramercy Park

Siemens going test vienna high resistance half ampere lamps sixteen candles against ours can you send yacht Express to look vienna Exposition few dozen special

Form. No. 3.

CABLE MESSAGE.

THE WESTERN UNION TELEGRAPH COMPANY.

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THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY	CHECK
141			

Received at 946 BROADWAY. 7 Sept 7 1882.

Dated

To

Never mind life Batchelor will be there test them will make some here but factory broke down answer when will send

Electric

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, Sept. 2 1882

Thomas A. Edison Esq.
Dear Sir:

Referring to your letter of the 1st inst. regarding the instruments to be sent to Munich for the Exhibition, I beg to say that the condition proposed ~~by you~~ as to the replacing of instruments lost and repairing those damaged at the said Exposition seems just and it is hereby agreed to in behalf of the Compagnie Continentale

I am,
Very Truly Yours,
J. H. Bailey

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THOS. T. ECKERT, General Manager. NORVIN GREEN, President.

NUMBER	SENT BY	REC'D BY	CHECK
36	Nu	Ax	15 pd

Received at 6 Westminster St., Prov. R. I.

Dated New York 6 10 30 Sept 6. 1870.

To Mr Insull.

Care Remington & Co.

Machine Works

Could not leave account cabling Station Paris See what contracts have patents & existing engagement

Bailey.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 6 Sept. 1882.

Thos. A. Edison, Esq.

Menlo Park. New-Jersey.

My dear Sir.

I acknowledge your cable of the 1st September as follows:

"Hitable engine six days."

It is very important to me to know about this as all my patterns are made except the base part for the engine, and I wait with impatience this news.

I also confirm my cable of to-day as follows:

"Send quick two large one small pratt whitney lathes machines and complete sets

owing to the fact that we cannot work 2 Engines together without Compelling the Governor we shall have to use the Portesuigne

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le

Small tools our work. also screw slotter."

These I am obliged to order as I do not like the french machines, and this style is not made in France. By forwarding these you will greatly help us. I have cable you for full setts of tools with same and as Bergmann and Dean know what screws are used, I think it will not be difficult to complete them quick. In a few days I shall forward you a check for 2000 dollars.

Yours very truly,

Chas Batchelor

1882-09-07

Palace Chambers, Westminster,
London. S.W.

7th September 1882.

T. A. Edison Esq
c/o Morgan Drexell & Co
New York

Sir,

I have been in communication with your friends in London on the subject of applying your electric patent to the lighting of Geneva, under the following circumstances.

About 20 miles from Geneva the water power of the Rhone is very extensive probably averaging 25,000 Horse Power & the French Government gave a perpetual concession to take therefrom 10,000 Horse Power. For this purpose an English Company was formed & expended upwards of £300,000 in constructing a tunnel from the upper to the lower waters, a large reservoir & Turbine House, and in buying the adjacent lands. Three Turbines producing 1950 Horse Power are in full work & the masonry for three similar ones is ready.

The Company also possessed large phosphate mining rights and erected phosphate grinding Mills, Sulphuric Acid Works, many dwelling houses &c.

The property is situate at Bellegarde a French frontier town & the Railway Station there of the Lyons & Mediterranean Railway, one of the largest in France from which four lines run, was connected by a branch railway with the Turbine House.

Two years ago I bought this property & two years ago I formed the undertaking into a limited Company

of which I am a Director & the holder of three fourths of the shares.

My brother Directors desire to continue the business by letting the power in small quantities to manufacturers, I am however of opinion that its advantages for Electric purposes are pre eminent & have therefore arranged by the end of the year to buy up all other interests, so that I may be able to deal directly in this direction.

The advantages are that power for electric purposes up to 10,000 horses can be supplied, that a concession for lighting & supplying motive power in Geneva can be obtained, also a Concession for lighting the great Station at Bellegarde and the various Stations between Bellegarde & Geneva, I ought to lay the wires along the Railway.

If this could be carried out successfully & the quantity of power admitted, Lyons, 70 miles off, might also be lit.

Overtures have already been made to me by the proprietors of the Faure & other electric patents, but as Mr Ruderman informs me that he has obtained the concession for an electric Railway on your system at Geneva & believing as I do that your great knowledge of the subject would command success I would prefer your system to any other, and if electricity is ever to be supplied in large quantities & at a distance from the generators, Bellegarde & Geneva would seem to offer every

1882-09-07

Palace Chambers, Westminster,
London. S.W.

possible advantage; and I may add that Steam power in that neighbourhood costs £20 per horse per annum while I supply it at £5.

Besides the advantage of proving your system in this the most central & largely visited place in Europe I am willing to offer a direct benefit to you and your friends if they assist in working out my project. Thus. The Capital of the existing Company is £320,000 & I am willing after carrying out the arrangement above referred to, that is, buying up all interests outside my own to give shares in the Company of the nominal value of £100,000 – for a Cash payment of £40,000 – and permit the gentleman finding this money to nominate the Board of Directors. The Company when so constituted could take up the Concession for lighting Geneva & the Railway aforesaid & also with you for the use of your patents, or a separate Company could be formed to take up these concessions & to rent from my Company the necessary motive power.

Yours faithfully

W. L. Aylmer

Copy

Charles Drayfel & Co
TELEGRAM ADDRESS
Drayfel
Stockholm

Stockholm den 8 Sept 1882

C. H. Winfield Esq
Edison's Foreign Electric Light & Motive Power Coy.
6 Lombard Street
London.

Dear Sir,

I have the pleasure to inform you that the Installation of the Edison System of Electric Light, made under your instructions in this City has been in operation since the 24th May with unvarying success.

Many persons of high rank & position including the Royal Princes the Governor of the City and Members of Parliament the Municipal Council and notables of this and other Cities have visited points where the system has been established.

The brilliancy of the lights, their perfect purity and steadiness and the complete absence of heat or noxious vapours or odours have been generally noticed

As regards the Cafe in front of the Royal Palace which has been illuminated by the Edison lamps it has been remarkably free

from during the summer from undue heat and visitors have been nightly attracted to it as much as by the comparative cool atmosphere, as by the novelty and perfection of the light itself. There is no doubt in our mind but that in a short time all public places of entertainment will find it to their account to adopt the incandescent lamps.

We are, Dear Sir,

Yours Truly

(Signed) Chas Dreydel & Co

[TO SAMUEL INSULL?]

FIFTH AVENUE HOTEL.
MADISON SQUARE, NEW YORK.
HITCHCOCK, DARLING & CO.

New York 9 Sept
1882

Dear Sir

Mr Edison has already given you instructions, I suppose, for ordering to Messrs Babcock and Wilcox the boilers for the Central Station of Milan. As it is an urgent question to have the boilers as soon as possible in Milan, I hope you will take care that the order shall be given immediately and the boilers made and shipped without delay.

At the same time I am sure you will be able to obtain for our Company the same reduced prices that Mr Babcock and Wilcox make to Mr Edison himself; and it is precisely with that hope that I have given the order through Mr Edison who had the kindness to attend to it

I remain dear Sir Yours truly
G Colombo

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 9 Sept^re

Monsieur Thomas A. Edison
Menlo Park

Mon cher Monsieur,

Nous avons reçu hier les deux colis filtres Chambon expédiés par Steamer St. Laurent.

J'ai l'honneur de vous informer au sujet de cet envoi, que la dénomination insérée au connaissement était erronnée, et que cette erreur pourrait porter un grave préjudice aux droits de nos Brevets français.

En effet le connaissement adressé à Lauda & fils du Havre, portait cette mention : Deux Colis lampes électriques en cuivre. — Cette erreur de déclaration nous a obligés à des démarches difficiles à la Douane, et vous apprécierez comme nous, combien il importe que les connaissements soient soigneusement libellés.

Agréez cher Monsieur mes salutations distinguées.

pour la SOCIÉTÉ Industrielle et Commerciale EDISON
Chas Batchelor

Don't bill any goods "Electric Lamps" but "Glass tube" or any other title ... C.B.

Which means:

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

1

New York, 12th Sept. 1882

J. F. Bailey Esq.
Dear Sir:

In accordance with our verbal communication, I beg to detail below the order for Electrical Machinery and apparatus required for the Central Station of Milan. This letter contains but a summary of what I consider necessary to order; but I have ~~also~~ agreed between us, that Mr. Edison himself will take care that nothing of what he thinks necessary for the success of the station will be omitted; and that he will make to the present order whatever variation or addition he may consider useful to enable the Committee of Milan to start the Station not later than the 26th of December, and to meet the engagements taken both with the private consumers and the Municipality. Mr. Edison will also make the necessary arrangements

with the several firms that have to supply each part of the plant for immediate delivery and shipment.

I will submit this order to the Executive Committee of Milan as soon as I arrive in Italy, any transaction of this kind being subject to be approved by them and to bear the signature of two of their members. The Committee will then forward the regular order to the Compagnie Continentale of Paris.

The machinery and apparatus to be supplied are included in the following list:

1°

One Dynamo for 1400 lamps, complete with engine, extra brushes, etc. It has been agreed between us that the first of the new Dynamos of 1400 lamps now in construction shall be reserved for Milan and shipped as soon as possible; and I should feel obliged if either you or Mr Edison will confirm this engagement.

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, ... 188

2°

Extra-brushes upright-wires and safety catches
trumps for ventilation and other accessories
for 4 Dynamos

3°

5000 lamps A
5000 lamps B } for Central Station
1200 testing ~~incandescent lamps for other lines~~
at the reduced price of 25 cents each, as
agreed with Mr Edison

4°

1500 lamp-sockets with cock
3000 lamp-sockets without cock
Sockets, safety catches, and plugs for 1200
testing lamps at a reduced price as agreed

5°

20 Meters for 50 lamps with extra bottles
5 " " 25 " } and plates

6°

4 Regulators for 4 Dynamos complete with plugs dial shafting etc.
4 Indicators complete
4 Current breakers complete
8 Feeder Regulators.

70

10 Coupling pieces at Station to connect Feeders with Dynamo-Main.
Extra large copper bars for 4 Dynamos say about 200 feet
Copper bars for testing circuits, say about 200 feet.
Canalisation as follows:
700 feet tube No 2
2400 " " No 2½ (or in case Mr. Edison thinks it safe and convenient, 1200 feet tube No 1½)
6800 feet Tube No 1½
6200 " " No 4
Additional tubes of each size, say about 5%

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, ... 188

of the above named lengths, to meet mistakes breakage, want of insulation etc.

Coupling boxes for feeders and street mains.

Cross-tee-coupling and elbow-boxes for street mains, according to the plan of network, with some extra-pieces in case of need.

24 Service boxes.

24 Main House Cut-out boxes etc

250 Wall Cutouts with caps

600 Ceiling Cutouts.

Switches each size 60

Assortment of fusible wire for 1 to 1400 lamps.

Electrolers Feeder regulators and special apparatus for the Scala to be ordered after my arrival to Milan.

Electrical instruments Galvano-meters, Sliding Bridge, Unit resistance, bobbing, photometer Standard Battery, portable battery etc to be

ordered in Europe. In any case there is always time to order them, if necessary to Bergmann & Co. after my return to Milan

It is necessary to add, as being agreed between us that Mr Edison will secure for us, from the Edison Machine Works Co. the Electric Tube Co. and Bergmann & Co. the best prices he gets for himself for all the goods included in the present order.

You and Mr Edison are well aware that the success of the Milan Central Station will be of a very great importance for the future of the Edison System in Europe; and the more so that, if successful, it would prove for the first time the possibility of introducing electric light in theatres on a large scale by experimenting with not less than 1400 lamps on the stage of the largest theatre in the world. I know you both appreciate the importance of our initiative which costs us a great deal of

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, 188

capital and activity, and feel disposed to do as much as you can to make it a complete success. Now the best way to do so is to supply us liberally not only with good advice but also with practical men, able to get up and start our station and to meet any difficulty that may arise.

With regard to this it is understood that Mr Atchison will remain in Italy until the station is regularly working; that Mr Bakeldor will personally inspect, and start it when set up; and that the Comp. Continentale will supply us in case of need, with such engineers as Mr Cunningham or others well qualified for the purpose that we may consider necessary for the success of our station. It is equally understood that Mr Patterson (of the Electric Tube Co) will personally superintend the laying

down of the pipes. I have asked Mr Edison to allow Mr Lieb (of the Central Station of Pearl St) to come to Milan under my orders, when we will be about to set up and start our station, say towards the end of November. I must say that I consider it absolutely necessary to have Mr Lieb who knows by practice all the difficulties of the first starting; and I have no doubt that Mr Edison will grant the required permission that I formally [illegible]

You will oblige me, my dear Sir, to give a written answer to all the points referred to in this letter, confirming what is stated in it and has been besides already agreed upon between us.

[illegible] dear Sir

Yours truly
G. Colombo

Colombo G.
Milan 28.11.87
116

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, 12th Sept. 1882

J. F. Bailey Esq.
Dear Sir:

According to what has been agreed upon between me and Mr Edison, you will please to inform him, that I have arranged with Mes. Babcock and Wilcox for the immediate delivery of 4 Boilers of 164 HP into furnaces the boilers to be invoiced and shipped by the same Firm of Glasgow. It has been understood between me and Mess. Babcock & Wilcox that Mr. Edison will give the order himself for these Boilers according to the specification they have given me, and that the price will be the same that is granted to him either by the New York or by the Glasgow Firm.

I shall feel obliged if Mr Edison will kindly forward the order with the least

possible delay, simply referring to the above named specification.

Yours truly
G. Colombo

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, 13 Sept. 1882

J. F. Bailey Esq.
Dear Sir:

To the order that I have given you in my letter of yesterday you will please to add:

500 feet Tube No 5
200 " " No 6

This addition has been made after my interview with Mr. Krueri this morning. Mr. Krueri will also add a quantity of small extra pieces of different kind and size, some Compound tape etc which do not require any special order.

I must also inform you that we have decided to order 1200 feet tube No 1½ instead of 2400 feet tube No 2½ (as was left undecided in my letter of yesterday)

I beg you to call Mr. Edison's attention to the fact that the specification handed to me by Messrs. Babcock & Wilcox quotes 4 Boilers of 164 HP in two batteries at the price of 2098 Pounds Sterling. Mr. Edison will see whether this price corresponds to the discount allowed to him by the Firm for Boilers delivered f.o.b. at Glasgow.

I remain dear Sir,

Yours truly,

G. Colombo

Geo. H. Babcock, Pres.
J. Wilcox, V. Pres.

Nat'l W. Pratt, Treas.
E. H. Bennett, Sec'y.

THE BABCOCK & WILCOX CO.
WATER TUBE STEAM BOILERS.
NO. 30 CORTLANDT ST.
NEW YORK.

48 S. Canal St. Chicago.
50 Oliver St. Boston.
116 James St. Glasgow.
32 N. 5th St. Philadelphia.

Sept. 14, 1882.

Thomas A. Edison, Esq.
Menlow Park, N.J.

Dear Sir:

We enclose you a copy of specification given to Mr. Columbo, for the Edison Electric Light Co., at Milan.

The price quoted was the lowest price which we could make to Mr. Columbo. We do not know, at present, what discount the Glasgow office can make on the above price, but whatever it will be, the Edison Co. will have the full benefit of.

Yours very truly,
The Babcock & Wilcox Co.

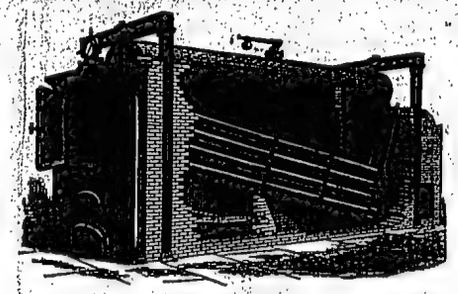
J Martinez

[ENCLOSURE]

SPECIFICATION

FOR

Babcock & Wilcox Boiler



of 656 Horse Power

FOR

Mr Columbo representing
The Edison E. L. C.
Milan.

The BABCOCK & WILCOX CO.,
30 CORTLANDT STREET,
NEW YORK.

Geo. H. Babcock, Prest.
S. Wilcox, V. Prest.

Nat. W. Pratt, Treas.
E. H. Bennett, Sec'y.

THE BABCOCK & WILCOX CO.

WATER TUBE STEAM BOILERS.

67 Carondelet St. New Orleans. | 48 S. Canal St. Chicago. | NO. 30 CORTLANDT ST. | 50 Oliver St. Boston. | 116 James St. Glasgow. | 505 Mission St. San Francisco. | 39 N. 5th St. Philadelphia.

NEW YORK AND GLASGOW.

New York, Sep 12. 1882.

SPECIFICATION FOR 656 HORSE POWER.

Arranged in 4 boilers or furnaces, and set in 2 batteries

To Prof Columbo representing The Edison Electric Light Co. at Milan. Italy. Room 291. 5th ave Hotel. New York.

SECTIONS. Each boiler to be composed of 12 sections or slabs, each section to be composed of 8 best lap-welded wrought iron tubes, four (4) inches in diameter, and 16 feet long, connected at the ends by continuous staggered headers, or "up-takes" and "down-takes;" the tubes to be fastened therein by being expanded into tapered holes.

Headers. Each "header" to be provided with handholes placed opposite the end of each tube, of sufficient size to permit the removal and renewal of a tube through the same, with joints made tight without packing of any kind. Clamps for handholes to be of wrought iron.

Connection. The several sections to be connected at each end to 2-30' steam and water-drums, and at one end with a mud-drum, by means of lap-welded wrought iron tubes, four (4) inches in diameter and of suitable length, expanded into bored holes.

Joints. No screwed or packed joints are used in the construction.

DRUM. The steam and water-drums (8 in number,) to be 30 inches in diameter and 16½ feet long, made of Flange Iron 5/16 inches thick, in three sheets; the longitudinal seams double riveted; the heads turned in lathe, and rivet holes drilled.

Manhole. To have a manhole in rear head, with faced joint, and two nozzles, one for safety valve and one for taking off steam, 4 inches diameter with 10 inch flange, faced and drilled. 2 drums to each furnace, connected by cross-pipes, steam outlet 6" dia 12" flanges

MUD-DRUM. The mud-drums (4 in number,) to be of cast iron, 18 inches diameter and 88 inches long, with 3 hand-holes and 2 separate

Blow-off. nozzles for blow-off pipe, 2½ inches diameter.

[ENCLOSURE]

SUPPORTS. Each battery ~~The boiler~~ to be suspended from 2 wrought iron compound beams, resting on 6 wrought iron columns, with cast iron bases and caps, properly fastened so that the boilers shall be supported entirely independent of the brick work, and free to expand or contract without affecting the same, and so that the brick work may be removed and replaced, if required, without disturbing the boilers or connections.

VALVES and FITTINGS.

Safety Valve. Each boiler to be provided with two safety valves 3½ inches diameter

Steam Gauge. One steam gauge twelve and one-half (12½) inches diameter, dial, mounted on ornamental stand,

Water Gauge. One stand pipe, fitted with large sized glass water gauge, and three patent gauge cocks with lifting handles;

Feed Valves. One check valve, 2 inches diameter,

One stop valve, 2 inches diameter,

Blow-off Valve. One blow-off valve 2½ inches diameter,

Cleaning Valve. Two stop valve, ¾ inch diameter, with necessary pipes and fittings

Piping. for fixing all the above to the boilers.

FRONT. The front of each battery to be of cast iron, full width and height, ornamental pattern, containing 4 fire doors with register 4 double ash pit doors, and large doors for access to the ends of the tubes; corners to return around brick work nine inches. All parts to be ample in strength; joints fitted by planing.

FIXTURES. The fixtures to consist of a full set of grate bars with bearers, for bituminous coal.
dead plate and girders, flame bridge plates with bolts, and special fire brick for lining the flame bridges; bridge wall girders and bars, binders and bolts, 8 ash and 20 cleaning doors for access to the exterior of tubes and the flues for cleaning, 4 dampers with frame, and the requisite I and T bars for openings in walls; smoke chamber T's and anchor bolts for front.

[ENCLOSURE]

TOOLS. *2 Steel wrenches fitting the handhole nuts, 2 tube scrapers with long handle, 2 set of fire tools, consisting of poker, slice bar and hoe, and hose for blowing dust from exterior of tubes, to be furnished.*

TESTING. *The sections and mud-drums to be tested and made tight under a hydraulic pressure of 300 lbs. per square inch, and the steam and water drums to be tested and made tight under a hydraulic pressure of 150 lbs. per square inch.*

QUALITY. *All materials and workmanship to be first-class in every particular*

ERECTING. *Full drawings and directions for erecting to be furnished, and services of man to erect,—board and traveling expenses to be paid by purchaser.*

DELIVERY. *The boilers to be delivered f. o. b. in ~~New York~~.* Glasgow.

PRICE. *for the sum of* Two Thousand & ninety-eight (£2.098) pounds sterling

TERMS. *One-half payable on presentation of sight draft with shipping receipt. Balance when erected per draft at 5 days' sight.*

The Babcock & Wilcox Co.

W. J. Martines

New York 14th Sept 1882

Mr Insull
Menlo Park

Dear Sir

The price asked by Messrs Babcock & Wilcox for their Boilers in their specification is the Glasgow price without discount. They told me that it was already very low, but I observed that they have admitted themselves that Mr Edison was entitled

Copy Sept 14/82

to a discount even on the Glasgow price-list; and therefore I expected they would make to Mr Edison the usual discount also in that case. I told them that I had put the matter entirely in Mr Edison's hands and left him to fix the price as if for himself. I take the liberty of informing you of that circumstance with the hope that you will do your best in our favour

Believe me dear Sir

Yours most truly

G Colombo

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, 14 Sept 1882

J. F. Bailey Esq.

Dear Sir:

As arranged this morning with Mr. Kruesi at Delmonico's in your presence it is understood that the order for the Canalisation will be definitely established according to the following list, which partially modifies my previous order of the 12th inst.

4700	Feet	Tube	#	1½
4200	"	"	"	2
6200	"	"	"	4
500	"	"	"	5
200	"	"	"	6

I have verified this afternoon after having left you, that the price for Boilers given in the specification is the Glasgow price without discount. Now I know by

Messrs. Babcock & Wilcox themselves, that Mr. Edison is entitled to a discount also on the Glasgow price-list. You will please therefore to remind Mr. Edison that I hope he will let us have the advantage of the discount he enjoys for himself. Messrs. Babcock & Wilcox have observed me today that the price of the specification was already very low; but I replied that I had left it entirely in Mr. Edison's hands to give the order and fix the price, and expected they would make to him the usual discount.

I am sure you will kindly give me the required answer to my letter of the 12th inst. before I leave.

I remain dear Sir,

Yours Sincerely
G. Colombo

Colombo G.
Apl. 14 82
Cairo

116

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

Compagnie Continentale

New York, Sept. 15 1882

see Electric Light General

Thomas A. Edison Esq.

Dear Sir:

Enclosed herewith we beg to send you copies of four letters addressed us by Prof. Colombo regarding the orders for the Central Station at Milan.

You will remark that Prof. Colombo states that two signatures are necessary to make final all the orders made by the Committee of the Edison Syndicate in Italy and that the orders given in these letters are subject to confirmation by the Committee of the Syndicate on his return to Milan.

You will notice that Prof. Colombo in his letter of the 12th inst. says that these letters contain only a summary of what he considers necessary to order, but he understands that you will take care that nothing

of what you think necessary for the success of his station is omitted and he expects that you will make any variation in the order that you may consider useful to the end that the Committee of Milan may start the station not later than the 26th of December. He also counts that you will make the necessary arrangements with the several firms and manufacturing Companies that have to supply the several parts of the plant for immediate delivery and shipment on the best terms possible

The following is a resumé of the order made in these conditions by Prof. Colombo.

1°

One Dynamo for 1400 lamps, complete with engine, extra brushes etc

2°

Extra-brushes, upright wires and safety catches, trumps for ventilation and other accessories for four Dynamos.

3°

5000 lamps A } for Central Station
5000 lamps B }

1200 testing or resistance lamps for the same at the reduced price of 25 cents each, as agreed with Mr. Edison

4°

1500 lamp-sockets with cock
3000 lamp-sockets without cock
Sockets, safety catches and plugs for 1200 testing lamps at a reduced price as agreed.

5°

20 Meters for 50 lamps } with extra bottles
5 Meters for 25 lamps } and plates
+ Extra supplies

6°

4 Regulators for 4 Dynamos, complete with plugs, dial, shafting etc.
4 Indicators complete
~~3~~ Current breakers complete 1 fuse
12 ~~8~~ Feeder Regulators.

7°

10 Coupling pieces at Station to connect Feeders with Dynamo-Main.
Extra large copper bars for 4 Dynamos say about 200 feet.
Copper bars for testing circuit, say about 200 feet.
Canalization as follows:

4700	Feet	Tube	~~N~~	1½
4200	"	"	"	2
6200	"	"	"	4
500	"	"	"	5
200	"	"	"	6

Additional tubes of each size, say about 5% of the above named lengths, to meet mistakes, breakages, want of insulation etc

Please to have Mr Kruesi add to the above order a quantity of small extra pieces of different kind and size, some Compound tape etc according to your judgment of what is desirable.

Coupling-boxes for feeders and street-mains; Cross, tee, coupling and elbow boxes for street mains, according to the plan of network, with some extra pieces in case of need according to your judgment.

24 Service boxes

24 Main House Cut-out boxes

250 Wall Cut-outs with caps

600 Ceiling Cut outs.

Switches each size 60

Assortment of fusible wire for 1 to 1200 lamps.

Regarding the Electrolers, feeder-regulators and special apparatus for the Scala, Prof. Colombo will make order after his arrival at Milan.

The Electrical instruments, the Galvano-meters, the sliding Bridges, the Mint resistance bobbins, the photometer, the Stand and battery, the portable battery etc Prof. Colombo expects to order in Europe. Should he find it necessary he will order them from

Bergmann & Co after his return to Milan.

Your attention is especially called to the remarks of Prof. Colombo in his letters of the 13th and 14th inst. regarding the price of boilers given by messrs. Babcock and Wilcox. He states that he has verified that the price for boilers given in the specification by Messrs Babcock and Wilcox is the Glasgow price without discount and that he knows directly from Messrs Babcock and Wilcox themselves that you are entitled to a discount also on the Glasgow price list; and we count with him, that you will secure for him the advantage of the largest discount that you can obtain from Messrs Babcock and Wilcox. Prof. Colombo considers it essential that Mr. Lieb should leave New York about the 15th of November and come to Milan for the purpose of aiding him in making the necessary connections for the Central Station and putting in motion

the machines. It is also understood between us that Mr Patterson after finishing the Crum and Munich installations will go to Milan for the purpose of placing conductors and otherwise aiding Prof. Colombo in such way as he may be able.

We have written Prof. Colombo today regarding the suggestion that he makes as to Mr. Batchelor Mr Atcheson and Mr Cunningham or others that may be able to give him assistance in the organization of the Central Station at Milan engaging with him on behalf of the Compagnie Continentale that all necessary assistance will be given to him.

We beg to concur with the observations of Prof Colombo in his letter of the 12th of Sept. as to the great importance of the Milan Central Station for the future of the Edison System in Europe and we beg to join with him in requesting your personal attention and interest in

the details of its organization and the making up and despatching of the necessary material.

Regarding the leading points in this letter will you kindly make reply today in order that Prof. Colombo may take with him tomorrow to Europe the assurances that are necessary to give him entire confidence in the success of his enterprise and that he may also give the necessary assurances to his friends in Milan as to the effectiveness and thoroughness of the arrangements made by him while in this country.

I remain,

Very Truly Yours,

J. W. Bailey

The Edison Electric Illuminating
Company of New York,
65 Fifth Avenue.

New York, Sept. 15 1882

Thomas A. Edison Esq.
Dear Sir:

Referring to your letter of the 13th inst. inquiring the extent to which Dr. Otto A. Moses cooperated with us during the Exposition and afterwards up to the date of March 1882 and the nature of the services rendered by him, we beg to say that during the first two or three weeks after the arrival of Dr. Moses at Paris, we had considerable relations with him and he prepared in connection with M. Hospitalier the articles whose insertion we had arranged for the insertion of in the official catalogue. He also visited the city of Blanc a town of some six to eight thousand inhabitants from which propositions came for the lighting of the city by the Edison Light.

At our request he prepared two or three articles for insertion in different journals. We were unable to make very much use of these articles owing to the fact that Dr. Moses was not accustomed to French journalism and his style and command of the language were not such as to allow of our making use of the material prepared by him.

On two or three occasions within our knowledge Dr. Moses made explanations of your Exhibit to gentlemen with whom we had made arrangements to visit it and we specially recall the visit of Mr. Jamin and his friends. On these occasions the explanations of Dr. Moses seemed to give much satisfaction.

Near the close of the Exposition the writer fell sick and was very little concerned with what passed from the early part of November until the

middle of January. The whole of this time however was passed in discussions and arrangements regarding the formation of the Companies provided for by the Contract of November 15 and in these Dr. Moses naturally took no part not having had connection with its negotiation or with any of the matters growing out of it.

With the exception of what is stated above we have no knowledge of any connection of Dr. Moses with matters relating to the Exposition or to the affairs of the Light Company of New York or of the French Companies during the period to which you refer following the exposition.

I remain
Very Truly Yours
J. F. Bailey
for H. Casper

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'Honneur

PARIS 1881

Ivry-sur-Seine, le 19 Sept. 1882

Thomas A. Edison. Esq.

55. fifth Avenue. New York.

Edison No 99

Dear Sir.

When you are sending glass, put in an extra quantity of glass for inside parts as in the first shipment they have broken a great deal for us; in fact it would be well to send a double quantity.

The antifriction metal I get here is good but I have a little trouble with it sometimes and it takes such an infernal heat that I have had to build a special furnace for it; also it sometimes shrinks too much. I wish you would send me about 100 kilos of yours, as I do not want to put this in

250 lbs Antifric — C.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le

in big machines if yours is better.

I acknowledge receipt of your cable as follows:

"Fibre glass one screw machine go Canada twentieth"

Yours very truly

Chas Batchelor

Memorandum

SOCIÉTÉ INDUS^ELLE & COMM^LE EDISON

Société Anonyme Capital 1,500,000 francs

~~PARIS~~, le Ivry Sept 24th 1882.

M. Edison

Menlo Park N.J.

R & C

My dear Edison,

Please give me the points on alterations of 2 dynamos so as to utilize the non-sparking point — I've just got notice that the drawings have been shipped — As I have nearly finished 20 machines they will be just about as useful as those early effusions of the illustrious Mott on telephone

Yours Batchelor

NUMBER	SENT BY	REC'D BY	CHECK
4	A D	C	15 Paid

ived at Ny Sept 25 1882

ated New York 25 1882

Mr Insull

Ok

Doubtful point in telegrams exchanged during negotiation Contract fifteenth November last mine & Edisons,

Barley

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le Sept 26 1882.

My dear Mr Edison,

In answer to your letter of the 13th I must say that the cooperation of Dr Moses which I expected I certainly did not get – He left me to do all the work during the day and only occasionally came round at night – In the formation of a company after the closing of the Exposition Nov 15th he certainly rendered no services whatever – I was intimately connected with the negotiations as one of your representatives and if he had helped them at all I certainly should have known it – In fact I saw him only once between the closing of the Exposition and the signing of our contract – He then asked me to help him to get an agency for Germany in the company he had heard we were about forming – I spoke favorably of him to Mr Porges who granted him two or three interviews, the results of which were that Dr Moses's terms were entirely too exorbitant to be entertained for a minute and Mr Porges requested that an answer to that effect should be sent to the Dr to prevent him from being bothered for 2 or 3 hours of the best part of his time every day

Very truly Yours Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'Honneur PARIS 1881

Ivry-sur-Seine, le 3 October 1882.

Samuel Insull

Menlo Park N.J.

My dear Insul,

I acknowledge receo your Cables on Stock sent some time ago — Also received to day :- "Edison, Johnson offered gouraud oriental telephone fifteen shillings cash do likewise" —

I have done so this morning as anything we get out of that is dead profit — Everything in Stocks seems to be very dull here not a thing doing at all

Yours

Batchelor

Ans 18 Oct

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 3 Oct 1882

Thos. A. Edison Esq

Menlo Park N.J.

My dear Edison,

I have just received another bill of lading marked "8 Casks of Electric lamps" Will you please have my glass always marked "Casks of Glassware" not "Electric Lamps" It has come through Hayward Perry and Franklin but I dont know whether they or some of you people made the "bill of lading"

Yours

Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 9 October 1882

RECEIVED OCT 21 1882

ANSWERED 25 Oct 1882

FILE No. 12

Thos A. Edison. Esq.

Menlo Park. New Jersey.

Dear Sir,

I confirm my cable of the 7th as follows:

« Armington here shall I give royalty make engines. »

I also acknowledge your cable of to-day as follows:

« Give royalty eight per cent his selling price here don't agreed exclusive use. »

In talking with Armington on this matter, he said that he had agreed with you for America for 10% royalty on selling price there. But I have no doubt that we shall make an arrangement

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le

(2)

with him, if we buy, for 8%. As regards the exclusive use of his engine, we should not agree of course to use his engine alone, nor do we want, in my opinion, the exclusive use of his engine for our purposes.

I am considerably in the dark as regards engines. My patterns are all made for the C Dynamo with the exception of that part of the base where the engine goes. I have got all my castings and all my forgings for two machines. You will see therefore that I am exceedingly anxious to know exactly what engines you are going to send me. Please do not forget that my drawings are for Porter's engine; and if you now decide on Armington & Simms, you must immediately ship me the drawings of it.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

(3.)

I think there is no doubt now that our friend Siemens will sue us in Germany for infringement on dynamo; in fact I believe he has taken the first steps towards it. It is also just as sure that we shall go for him on the lamp as he infringes us there. In view of the fact that the English Company (as I hear) pays a small royalty to Siemens, do you not think that it would be advisable to settle the dynamo matter similarly, and go for him on the lamp?

I think it would be well if you would send me all informations on the early work of dynamos, also the testimony that was taken in the railroad case, if there is any more than what you already sent me, so that I can be prepared, if called upon at any time, with the best

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le

(4.)

memoranda: the same thing you might send me for the lamps, as we shall have to fight Swan, Maxim & Siemens perhaps in more countries than one.

Yours truly

Chas Batchelor

1882-10-02

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

RECEIVED OCT 26 1882

ANSWERED

FILE No. 33

Ivry-sur-Seine, le 30 Oct 1882

My dear Insull,

Many thanks for your letter — It eases my mind a little to see that my assessments over there are being met — From your letter I should think the prospects good for both Lamp Co and Godeck & Works — Am glad I am in a little (indirectly) at Bergman & Co; of course it will make money! — Anything of that kind that C.H.J. is in is bound to make money and I'll take my chance every time —

We are getting along here nicely now, only glass bothering us at factory and three enquiries for C dynamos. But I tell you I have had a good time on it!!

I am getting some tests on my lamps for life now and shall be able to give you the results shortly —

I think there is now every likelihood of a

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 2

Central station at Paris — We are working like the devil for it and before long we shall have the right for laying the wires in the streets for two kilometers square in the heart of Paris — I have selected the place and figured out numerable plants from 10000 lights up to 40 000 on it; and I dont hesitate to say that at this part I can get a 7 hours average burning for each light — I dont suppose you can do it any where else in the world than here —

I expect hourly now to have word that our engines are finished at Brienne when I shall leave to start the theatre here —

I have ordered the Galvanometers and will send them on as soon as possible; also the Berthoud Borel Cable Co. shall have my immediate attention as regards Edisons request. —

Armington has been here and from his talk I see he wants us to pay a royalty for making his engines — He said he had seen

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

3

Bailey in Newyork and I therefore told him that we would not do anything about it until he arrived — I telegraphed Edison ~~this~~ and of course you know you advised 8 per cent on his selling price there — We will settle the matter as soon as Bailey comes and he returns from Berlin —

Seibel's account. When I go to Brünn I shall call at Munich and see Seibel and get this settled —

Do you think it at all likely that Fabri will take up the option on the shares of European that he has from Edison and what is the term of option?

Yours truly

Chas Batchelor

COMITATO

PER LE APPLICAZIONI DELL' ELETTRICITÀ

« SISTEMA EDISON » IN ITALIA

RECEIVED
OCT 23 1882
ANSWERED

.....188... MILANO, 10 October 1882

FILE No.....

Dear Sir

In the hurry of my departure from New York I forgot to ask you a favour. Would you be so kind as to give me your likeness with your signature?

Yours truly

G Colombo

COMITATO

PER LE APPLICAZIONI DELL'ELETTRICITÀ

"SISTEMA EDISON" IN ITALIA

Via Manzoni 12

RECEIVED
OCT 23 1882
ANSWERED

Indirizzo per Telegrammi
EDISON MILANO

FILE NO. 10

MILANO, 10 October 1882

T. A. Edison Esq. — New York

Dear Sir —

It is a week that I am in Milan, and I have made in this interval all the preliminary arrangements for the Central Station. — The construction of the Machine Hall and stack is progressing rapidly. — I have arranged, in accord with Mr Edison, every thing connected with the illumination of the Scala, which will require 18 separate Carbon regulators for the different groups of lights. We will make a study of them in order to satisfy all the conditions of the place and then we will either make them ourselves or send you a drawing to have them made by Bergmann & Co.

I think we can overcome all the difficulties, but I do not conceal that the task is not an easy one.

If the tubes, boilers and apparatus ordered by me in N. York arrive in time, perhaps I shall succeed in lighting the Scala in the first days of January, but I do not expect such a result. You can aid me in this, by kindly paying your attention that everything be made and shipped with the greatest possible speed.

I beg now to make some questions which I hope you will answer or have them answered by Mr Clark who by return post.

Mr Clark promised me a full account of the progress of the Pearl Street Station since my

departure; whether you work now with more than one Dynamo and what has been the practical result of the Coupling of the governors. If this is as good as your telegram sent to me in Paris induced me to believe, I beg Mr Clarke to send me a sketch and a description of it without delay — For the future I should be very grateful if you will send me detailed reports of any improvement or modification in your system in the Pearl Street Station —

2° What section of Carbon do you think necessary to adopt for a Regulator? Suppose, for instance, we have 100 lamps A to regulate & to bring them down to a dull red by degrees, what the area of the total section of the Carbon rods must bear in comparison with the area of the Copper wire, to offer the same resistance when all the lamps are thrown in? In other words, what is the Comparative resistance of Carbon and Copper? I found no satisfactory figures in the books about that.

3° What size would you advise me to adopt for a Fan for 4 C Dynamos? Or else how much air does a C Dynamo require at least, to keep it cool?

I have been to London according to your desire and inquired of Sir John Lubbock; but he was abroad on a tour in Switzerland. As he was not expected to be back in less than 15 days and I was summoned urgently back by my friends, I left London the following day and returned to Milan without even touching Paris.

Mr Acheson is very useful and works hard. I could not absolutely go on without him. I told him that you wished him to remain until our Station is

regularly working, and he is quite willing to remain. But I perceived that he should very much like to have an order from you, as I have informed you soon after my arrival to N. York. Will you be so kind as to write or cable him a few words to that effect?

I have cabled you to-day about that.

I correspond regularly with Mr Patterson and he will come to Milan just in time to lay down the first tubes shipped.

About the end of November, the Dynamos will be completely fixed, and I shall want Mr Lieb. He may therefore leave N. York towards the middle of November, as understood. As you kindly promised me, you will fix yourself the terms for him during his stay in Milan.

There has been a misunderstanding, I think, about our fourth Dynamo. I had arranged with you to have the first of the 11 new Dynamos that were in course of construction in Goerk Street. But it seems that the people in Paris were not aware of this arrangement because they sent us a Dynamo from Antwerp. Shall I take it, or await your Dynamo? I should prefer this, on account of its being made for 1400 lamps; but I will submit to your advise on this point.

I do not know whether Mr Bailey is still in N. York. If he is in N. York, please to salute him and tell him that I am anxious to hear of his return to Europe on account of our correspondance with the Company of Paris.

I thank you cordially for your kindness towards

Hoping to have news from you at your earliest convenience and wishing always upon your behalf for the success of our enterprises remain, dear Sir,

Yours faithfully

J. Colombat

Please to inform me what price can have you definitely fixed with Messrs Babcock & Wilcox for your Boilers

Oct 10. 82

Columbus

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

RECEIVED OCT 24 1882 ANSWERED

FILE No. 11

Ivry-sur-Seine, le 11 Oct. 1882.

Thos A. Edison. Esq.

Menlo-Park. New-Jersey.

Dear Sir.

I have just received from you 3 samples of carbon moulds for carbonizing fibres. They are however so broken up that I cannot do anything with them, except get their size. They ought to have been put in a paste board box. Can you supply me with these here and at what price? or is it necessary for me to make them myself.

Yours truly.

Ch Batchelor

— They look very fine —

C B

Mr. Edison,

I am not sure who owns Portugal. Is it Gouraud or is it the English Company. I believe it is not included in any of the territory that I am looking after. I accordingly hand this letter to you.

Acd 12th Oct

S. B. Eaton

October 12th. 1882. per Mc.G.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITE

Grand Diplôme d'honneur PARIS 1881

RECEIVED OCT 28 1882

ANSWERED 29th Oct 1882

FILE No. 4

Ivry-sur-Seine, le 14th Oct 1882.

My dear Edisons,

The Indian and Colonial Company through their secretary have applied to me to know whether we can furnish material for Edison lighting — Hortsek one of their Engineers was here the other day on his way to Bombay and I learnt from him that both the Indian and Colonial and the English Co were looking round to get manufacturers for the system. I asked if Edison could not supply them; and he told me that he understood that you could not supply them after they had got what you had agreed to furnish them with — Now what I want to know is this: —

1 Do you not intend to furnish England?
2 If not, do you want me to bid for the work?
3 Do you want them to make everything in England?

Yours truly

Chas Batchelor

SOCIÉTÉ ELECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

ADRESSE TÉLÉGRAPHIQUE
EDISON, PARIS

RECEIVED
NOV 3 1882
ANSWERED
21 Nov. 1882
FILE NO. 4

Paris, le 19th October 1882.
33 Avenue de l'Opéra

Thomas Alva Edison Esq.
New-York

Dear Sir,

We have just learned from the persons of our C^e who have gone to America and returned lately that you have been making experiments for inventing accumulators.

We should be very happy if you will kindly keep giving your attention to this matter, as it would prove most valuable for the introduction of our light in Europe.

In our cities, and owing to the mode of construction of houses, it is impossible to put any machines in many places where the electric light would be accepted quite willingly; in other places, where there would be room for putting up machines, we are also prevented doing so by the police-laws on boilers, which are never allowed to be put under any inhabitated apartment.

The invention of a practical accumulator would open us a new and immense field of action.

We would also have great benefit if you could make some automatic regulator, still the question of accumulators is of much greater importance to us.

We are, Dear Sir,

Yours very faithfully,

SOCIÉTÉ ÉLECTRIQUE EDISON

Louis Rau

Administrateur délégué

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'Honneur PARIS 1881

Ivry-sur-Seine, le 25 Oct 1882

My dear Edison I have just received the following from Mather and Platt of Manchester

Chas Batchelor Esq

Dear Sir Will you be good enough to quote us a price for complete armatures for the Edison dynamos for 60 and 250 light, also kindly say how soon you could deliver 2 of each size We intended to order same from New York but having seen your most complete and well organized works we feel certain you can serve us in this matter We are yours truly

Mather and Platt

To which I answered :—

Messrs. M. & P. At present I am not in a position to supply you with the armatures you desire as our people here are taking them as fast as we can make them — I have as yet only made F, Z, and K's and have not finished any of the I, R and C's — I believe Edison can furnish you immediately with all you want and I will cable him if you desire Yours Chas Batchelor —

Société Industrielle et Commerciale Edison

Société Anonyme, Capital: 1.500.000 Francs

Grand Diplôme d'honneur Paris 1881

Ivry-sur-Seine, le 27 7 1882.

T. A. Edison Esq.
6 Fifth Avenue
New York.

Dear Sir,

Enclosed please find page from "La Nature" on the "Nouvel Chanigue Electro Generateur" —
I was struck with it as being direct production of Electricity by Combustion — I know Dr Brard and I have requested a test of his briquets.
He kindly sent me 2, which I burnt and got a Current of about 1 Ampère from Each. There was a variation in resistance, but they were made by hand, of course Cannot be Considered good. I asked him to give me 2 for you. He has done so, and I will forward them to you —

I do not send this thing as being in any way cheap or to Compare with other methods of producing Electricity but you Know better than I, that the direct production of Electricity by Combustion is as much as we Ever hope to get. The Doctor has no Patents in America but is about taking them. I have engagement with him to talk over the matter of an interest in his patents in America. It looks very small at present, but six months of our Experimenting might show it a Much better thing.

Yours very truly
Charles Batchelor

[ENCLOSURE]

copiques. Cet ouvrage, destiné à instruire les élèves, se recommande aussi aux amateurs, aux gens du monde, et aux maîtres eux-mêmes.

BOUGIES ET BRIQUETTES ÉLECTROGÈNES

DE M. LE Dr BRARD, DE LA ROCHELLE

La production de l'énergie électrique pour les applications scientifiques, domestiques et industrielles a été obtenue jusqu'ici à l'aide d'appareils qu'on peut diviser en trois groupes distincts : 1° les piles à liquides ou générateurs *hydro-électriques;* 2° les piles ou générateurs *thermo-électriques;* 3° les machines ou générateurs *dynamo-électriques;* suivant qu'on fait appel à l'action chimique, l'action thermique ou l'action mécanique.

Les intéressants travaux de M. le Dr Brard, de La Rochelle, dont les premiers résultats ont été présentés par leur auteur au dernier Congrès de l'*Association française pour l'avancement des sciences*, montrent qu'il faudra bientôt y ajouter une nouvelle classe de générateurs électriques dont la place naturelle se trouve entre les piles hydro-électriques et les piles thermo-électriques proprement dites. Le véritable nom de ce nouveau mode de production de l'électricité serait en effet générateur *thermo-chimique*, le courant étant en réalité engendré par une action chimique produite à une température élevée.

La réaction chimique qui donne naissance au courant est la combustion du charbon sous l'action d'un corps oxydant comme l'azotate de potasse ou l'azotate de soude; le charbon joue le rôle de zinc dans les piles hydro-électriques ordinaires, et le courant produit va, dans le circuit extérieur, de l'azotate au charbon.

La première *expérience* dans laquelle ces courants ont été constatés est due à Antoine-César Becquerel, qui la décrit ainsi dans son *Traité d'électricité et de magnétisme* (tome Ier, page 183, année 1855) :

« Si l'on fixe à l'une des extrémités du fil d'un multiplicateur un creuset de platine rempli de nitrate ou de chlorate de potasse fondu, et que l'on attache à l'autre extrémité un morceau de charbon de cornue dont le bout a été préalablement porté à la température rouge, en plongeant ce charbon incandescent dans le bain en fusion, on a un courant énergique dans un sens tel que le charbon est négatif et le nitrate de potasse positif. Cet effet est dû à la combustion vive du charbon aux dépens de l'oxygène du bain en fusion. Pour que l'expérience réussisse, il est nécessaire de maintenir le morceau de charbon avec la main, afin qu'il ne touche pas aux parois du creuset. »

Cette expérience était tombée dans l'oubli lorsqu'en 1877, elle fut répétée par M. Jablochkoff, d'une façon tout à fait indépendante et sans avoir connaissance des travaux antérieurs de Becquerel, mais il ne donna aucune suite à ses recherches.

Tout récemment, l'idée a été reprise par M. le Dr Brard, de La Rochelle, et la question a fait, entre ses mains, un pas très important puisque les bougies et les briquettes de cet inventeur constituent aujourd'hui un véritable *combustible électrogène* fournissant à la fois de la chaleur et de l'électricité. M. Brard espère même arriver à construire un véritable poêle électrique produisant en grand et d'une manière continue ce que les bougies et les briquettes fournissent aujourd'hui en petit d'une manière discontinue.

Sans vouloir préjuger en rien de l'avenir réservé aux projets de M. le Dr Brard, nous nous contenterons de citer ici une réflexion fort judicieuse de M. Niaudet à l'époque où M. Jablochkoff fit ses premières expériences sur sa pile à charbon : « La pile de Volta elle-même, lorsqu'elle fut inventée, n'était qu'une nouveauté purement scientifique et on était loin d'y voir un objet d'utilité pratique. »

C'est ce qu'on peut dire aujourd'hui des premiers résultats obtenus par M. Brard et que nous allons résumer ici.

Bougie électrogène. — Le petit appareil auquel M. Brard a donné ce nom, à cause de son analogie de forme extérieure avec une bougie, a pour objet de fournir pendant quelques instants de la chaleur, de la lumière et de l'électricité. Voici comment cette bougie est constituée :

On fait un aggloméré avec du charbon pulvérisé agglutiné avec de la mélasse, tassé dans un moule et formant un petit cylindre emprisonnant des fils fins de cuivre qui sortent à l'une des extrémités pour former le pôle négatif. Ce cylindre de charbon est enveloppé d'une feuille mince et isolante de papier d'amiante, et le tout, après dessiccation complète, est trempé vivement et à plusieurs reprises dans un bain d'azotate fondu jusqu'à ce qu'on y fasse adhérer une couche de 6 à 7 millimètres d'épaisseur. On recouvre le nitrate refroidi d'une feuille de clinquant ou on l'entoure de quelques fils de cuivre destinés à former le pôle positif, et on recouvre le tout d'une dernière feuille de papier d'amiante.

L'appareil ainsi construit présente grossièrement l'aspect d'une bougie dont le charbon constitue la mèche et l'azotate la stéarine. En fermant un circuit entre les deux séries de fils métalliques qui constituent les pôles de la bougie, et en faisant rougir le charbon à l'autre extrémité de la bougie jusqu'à l'enflammer, on obtient un courant qui dure autant que la combustion de la bougie; un galvanomètre intercalé dans le circuit révèle des variations brusques dans l'intensité du courant, variations dues à l'irrégularité de la combustion de cette bougie.

Cependant, à cause de l'énergie de la combustion due à la présence du nitrate, la bougie fuse et ne dure qu'un instant. Il fallait atténuer cette combustion vive, et c'est ce qui a été réalisé dans les briquettes électrogènes.

7th Oct 1882

Briquettes électrogènes. — La briquette de M. Brard n'est pas autre chose, en principe, qu'une bougie de fabrication plus simple et à combustion lente. On obtient ce résultat en mélangeant au nitrate une certaine quantité de cendres qui, pour donner de bons résultats, doit être environ trois fois plus grande que la quantité de nitrate, ce qui réduit son activité comburante dans la même proportion.

Les figures 1 à 5 montrent les dispositions des briquettes actuellement établies par M. le Dr Brard.

Ces briquettes présentent extérieurement la forme d'un parallélipipède (fig. 5) de 15 centimètres de longueur, 35 millimètres de largeur et 25 millimètres d'épaisseur. Le charbon de la briquette se compose de 100 grammes de poussière de houille agglomérée soit à l'aide de mélasse, soit à l'aide de goudron de houille ou *brai*. La pâte ainsi obtenue est fortement comprimée, soit à froid, soit à chaud, dans des moules en fonte, dans lesquels ont été préalablement disposés des fils fins de cuivre, de laiton ou tout autre métal bon conducteur qui se trouvent ainsi emprisonnés dans l'aggloméré de charbon (fig. 5) et viennent sortir à une de ses extrémités pour constituer le pôle négatif.

Le moule est disposé pour que la briquette qui en sort soit perforée dans toute son épaisseur de trous nombreux destinés à faciliter la combustion et à multiplier les points de contact du charbon avec le nitrate. La face supérieure du charbon porte des dépressions rectangulaires de 15 millimètres de profondeur divisées en compartiments plus ou moins nombreux par des cloisons transversales obtenues pendant le moulage. La surface des compartiments est tapissée par une feuille mince de papier d'amiante ou tout autre matière isolante réfractaire et poreuse qui doit séparer le charbon du mélange de nitrate et de cendres. Ce mélange, composé d'une partie de nitrate (potasse, soude, etc.) et de trois parties environ de cendres, est versé très chaud et à l'état sirupeux à la surface de l'aggloméré; on en met environ 100 grammes en ayant soin de noyer dans la masse de nitrate une lame de laiton fendue en un certain nombre de brindilles et dont l'extrémité libre constitue le pôle positif.

Le tout est entouré d'une feuille d'amiante de 3 à 4 dixièmes de millimètre d'épaisseur.

Il suffit de placer cette briquette dans un feu ardent, par l'extrémité opposée aux lames de laiton, pour obtenir au bout de quelques minutes un courant continu et constant, si la briquette est homogène, pendant toute la durée de sa combustion; c'est-à-dire de une heure et demie à deux heures.

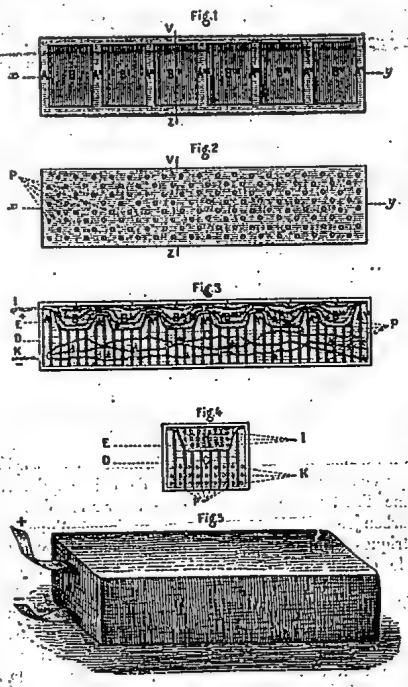


Fig. 1 à 5. — Briquette électrogène de M. le Dr Brard.

Fig. 1. Vue en dessus du charbon A, A', A''...., cloisons tapissées d'amiante. — Fig. 2. Vue en dessous, montrant les trous P destinés à faciliter la combustion. — Fig. 3. Coupe longitudinale, suivant XY. — Fig. 4. Coupe transversale suivant VZ. — Fig. 5. Vue d'ensemble extérieure de la briquette.

Une seule briquette suffit pour actionner une sonnerie du modèle ordinaire du commerce, trois ou quatre de ces briquettes montées en tension et brûlant simultanément décomposent l'eau.

Bien qu'on ne puisse considérer jusqu'ici ce résultat comme véritablement industriel, il n'en constitue pas moins un progrès sérieux et important lorsqu'on le rapproche des expériences de laboratoire de Becquerel et de M. Jablochkoff.

Il importe de remarquer que dans le combustible électrogène imaginé et fabriqué pour la première fois par M. Brard, le corps oxydé est du charbon qui remplace le zinc des piles à liquide tout en étant d'un prix incomparablement moins élevé; le corps oxydant, azotate de potasse ou de soude, est aussi d'un prix relativement modique, comparé à l'acide azotique des piles Bunsen, par exemple. Le foyer électrogène que M. Brard cherche en ce moment à réaliser en créant, en quelque sorte, des briquettes à renouvellement continu, pourrait donc être, en principe, très économique, puisqu'il produirait à la fois de la chaleur et de l'électricité, toutes deux directement et distinctement utilisables.

Nous ne pouvons qu'encourager les recherches dans cette voie, et souhaiter à M. Brard un succès qu'il est légitimement en droit d'attendre.

E. Hospitalier.

Bouchon 36 Oct 27 92

10

Oct. 11. 82

Grand Hotel
Brünn Oct 29/82

Thomas A Edison Esq
Menlo Park N.J.

My Dear Sir

You may be surprised to hear that I have shifted from Paris to Austria and have installed the Plant at Brünn. Everything is almost finished and goes weele. I started the machines last night and lighted the Auditorium, vestibule and foyer. You cannot image what a surprise it was to the people here, the mayor of Brünn ~~at~~ was at the time to a concert, and came directly to the theatre and was very much pleased. The only thing that remains to be finished is the regulator, and we were kept back from erecting it by some masons who were working at the place where it is intended

to stand. This installation is no doubt the finest one ever erected, as all wires are concealed in the walls, and all chandeliers made suppers ly for our light. The regulator is a nice piece of work, and consists of resistance coils capable of carrying from 10 to 700 Amperes. I have telegraphed to Batchelor and he will be present when I start the whole plant which will be in 5 days. Perhaps you do no know that this theatre has no connection with gas, and that everything is dependent upon the electric light. Our Engine works verywell and the dynamos are all in good condition. I will give you further information after the first opening.

Yours very truly

James J. H.

Brienn Austria Nov. 10 1882.

My dear Edison.

I acknowledge your cable of 3rd as follows:- "Armington engines work together perfectly will send drawings base" This eases my mind considerably — In the defect report for Oct 21st 1882 I notice that you are having trouble with your binding wires on armature — Every armature that you send me I always instruct my men to order all binding wires all round before putting in and I never have any trouble with any of them I think it is very important to have Dean do this on all — I worked all night the first night I came here to do this although I had to take all armatures out & put them back again, since being here I have carefully watched these K's burning the man that has to hand them myself & set brushes and with three in

2

circuit and 800 lamps on I have failed to see a spark at commutator yet, I consider this machine on perfection for 250 lamps — I have made some now and got them working in Paris they are equally as good as american — Everything works splendid at the theatre here and on Sunday we are to have a grand rehearsal and open Monday — I have got Munich, Vienna, & Berlin, theatre directors here and shall give estimates for lighting the principal opera houses in those cities As I have now something definite to base my calculations on better than before we shall be able to draw a revenue from these — I note what you say on royalty to Siemens

Yours

Batchelor

Answered

mcs

Royal Hotel, Berlin
Nov. 10th 1882.

My dear Mr. Edison:

At the time of the Exposition of Electricity at Paris I called to see Dr. Werner Siemens at his hotel but he was out. I left my card and invited him to give me an interview, but I never heard anything from him. I did this because it seemed to me a good thing to arrive at an understanding with Siemens in Germany as he had made a very favourable expression regarding your exhibit.

You will see from a report of negotiations with Messrs. Landau and consorts enclosed herewith that the Edison German Syndicate had the intention of bringing Siemens into the affair. They said to us that Siemens position and influence were such in Germany that it was extremely desirable to have an understanding with him. On arriving here Mr. von Kauffmann of the house of Landau called on Dr. Werner Siemens and made overtures to him for an understanding, and proposed that I should visit him. The interview was appointed for today and I have just come from it.

I commenced the conversation by saying to Dr. Siemens that I had great pleasure in commencing a conversation having in view an understanding between the Edison and Siemens interests, and that I was entirely sure that you would share this

pleasure, and that I could assure him that there was no one who was more cordial and generous in his appreciation of him (Dr. Siemens) and others of similar position than yourself, or more ready to come to an understanding with persons who had real claims to consideration rather than to enter into contests. Dr. Siemens replied to this that he had the highest appreciation of your own work, but that his feelings towards you personally had been affected by something that had been said by your representative (a German he believed) at the Paris Exposition of 1878. in regard to telephone matters - who had said that he (Siemens) had robbed you. I replied to this that I had no knowledge regarding it, and that whether such an expression had been made use of or not, I was entirely sure that ~~no such expression~~ it would not have been approved by you. I then said to him that the Edison people in England had recognized him in regard to the dynamo, and that that was with your consent and approval, and told him that I had made the suggestion at Landau's on my arrival here, as a basis of understanding with him that he should recognize the Edison patents on the incandescent lamp in Germany by the payment of a royalty, and that the Edison Company should license him to manufacture, or should sell him, Edison lamps on special terms, and that he (Siemens) should combine with

us in support of the German Edison patents and that thus we should hold the market between us; and that we on our side should recognize him on the dynamo. This however was not practicable because one of the gentlemen present had informed me that he (Siemens) had no German patents on the Dynamo. I said to him that I proposed then the recognition of the Edison patents on the incandescent lamp in the manner proposed as the first point for an entente; that if your patents were not good there were no patents on the incandescent lamp, and it was therefore in the public domain; and that it was for his interest, provided we were together, that the patents on the lamp should be held. I then told him the opinions that were held by experts in the different countries where we had the patents examined, and told him that we had agreed last week to send notices to all manufacturers and sellers of incandescent lamps in Germany that they were infringing your patents, that we should hold them liable for damages; and that it would be desirable if an understanding were possible between us that it should be made before any unpleasant circumstances should occur to create new difficulties. He then said that he supposed we had felt weak on our patents because no proceedings had been taken anywhere, and that he saw many persons manufacturing incandescent lamps, and that finally

he had made experiments in their manufacture himself, but that he had not sold any and should not do so pending the decision of the question as to the patents. He then went on to say that if we had an understanding that he thought it should be extended to other countries than Germany, and suggested an arbitration as to the question of the dynamos in France, and offered to leave it on their part to the decision of Pouillet who is our own Counsel in Paris, and who will plead the Maxim case. To this I replied that we would accept this method of settling that matter.

He then spoke of interference cases, I believe on the dynamo, and on the Electric railway in the States. I told him in reply to that that I would write you by the first mail, and would ask you for information regarding the situation of those cases and your views as to the method of an understanding.

Mr. Charles Siemens who has been in the English house for a number of years, and who is now in charge of the Siemens house in Russia, was present, and said that we might make an arrangement also to work together in Russia, they taking lamps from us on such terms as might be agreed, and we dealing with them in such articles as we might need in the way of cables, or perhaps arrange for the making of machines by them.

I am aware of the questions that might be raised as to going into any arrangement for manufacturing by them of any part of articles in your system, and wish you would write your views as to making an arrangement with them for the manufacture, for example, of dynamos.

Siemens said in regard to your patents on dynamos in Germany, and in regard to your patents generally that Americans frequently made the mistake of supposing that the German patent law was similar to the American, and especially on these two points. The German patent law was explicit (1) That only one invention could be covered by one patent, and that if more than one invention was embraced in the same patent that the patent would be declared null for that reason; that among American and English patent solicitors many were ignorant of this fact, and included many points in the same patent and thus rendered them invalid; and he made the suggestion that it was possible that this error might have been made in the case of some of your patents. (2.) That if any ~~process~~ device or manipulation described in the patent could be proved to have been practiced by any person previous to the date of the patent, for infringement of which he was prosecuted, it would be a complete defence; that he had been engaged for 30 years in electrical work, and that so far as he was concerned personally he should probably

have a valid defence on many points of patents that another person differently situated might not have; and that this defence was good even if the process or manipulation had never been published. You will appreciate the force of this suggestion, as it would probably be quite easy for Mr. Siemens to produce proof from his own establishment of a good many things.

In conclusion, it was agreed that Mr. Siemens at once consider the question as to whether he desired to recognize your patents for the lamps in the manner proposed; that we would examine also the situation in France as to the dynamo; that I write you asking for information and for your suggestions regarding an arrangement in the United States; and that the question of manufacture of certain parts of the Edison system in Russia and in Germany be taken into mutual consideration.

Both Dr. Werner and Mr. Charles Siemens were extremely cordial in the expression of recognition of yourself. I had a conversation aside with Mr. Charles who speaks English perfectly, while Dr. Werner speaks both French and English quite imperfectly, going over different points in our conversation and making them more clear. During this time Mr. Von Kauffmann who had taken no part in the conversation between the Messrs. Siemens and myself had a conversation with Dr. Werner and arranged with him a compromise on the conflict now going on between them and

Siemens for the lighting of the Royal Opera and the Royal Theatre in Berlin. It was agreed that certain parts of the house should be lighted with the Siemens arc light, and that Siemens should furnish the cables and the electrical fittings generally, the question of machines being left for discussion with Batchelor who is now at Brünn, and to whom I have telegraphed asking him to come here, on his way to Paris, the day after tomorrow; the installation to be known to the public as an Edison installation.

Will you please give me your views and suggestions as to any matters that may occur to you regarding these affairs and write me at Paris the earliest date possible as it is quite important that an understanding be concluded for Germany the soonest possible ~~day~~; and I think it will be for our mutual advantage to extend it as far as possible in other countries on the Continent. As to the situation in the States, of course I know nothing.

I shall write again in a day or two probably to report as to the final bases agreed on for the bringing out of the German Company. The Syndicate declares its option for the factory and the small plant Company at once, and proposes making an issue of either 5 or 10 million marks in the course of the next fortnight.

Very truly yours.

J. F. Baily

P.S. Enclosures mentioned are to be sent to Major Eaton in a few days as these are not now complete.

Thomas A. Edison Esq
65 Fifth Avenue
New York. U.S.A.

[ATTACHMENT]

Memorandum

Nov: 11th 1882.

I Mr. Bailey noted for final discussion following point as to the but of the Society. Mr. Kauffmann had stated the proposed but of the Society to be:-

1. The exploitation of the Edison incandescent light.
2. The industrial applications of electricity in general.
3. The purchase of brevets, or the taking of licenses etc, but this always subject to the approval of the Company Continentale in case they involve any expenditure of money for purchase or payment for licenses.

The second point was noted by Mr. Bailey for further discussion.

II He also noted that in the resume given by Mr. Kauffmann the expression "lamp which should be bought or manufactured," was made use of, saying that if there was to be one Company there could be no question of buying lamps except they could be bought from licensed Edison factories. This was accepted by Mr. Kauffmann and Mr. Sulzbach.

III Mr. Kauffmann stated that the Company of Fabrication was to be bound to furnish all apparels to the Syndicate for the exploitation of Central stations at a price not exceeding 30% above the cost of manufacture.

Bailey proposed to amend this by adding that these prices should never be higher than the factory prices at Paris. This was accepted by Messrs. Sulzbach & Kauffmann

[ATTACHMENT]

IV. Kaufmann stated in his résumé ~~that the Company~~ that the Compagnie Continentale was to make delivery of appareils with the exception of lamps at prix contant until the establishment of the German factory.

To this Bailey proposed that there should be a restriction as to the length of time that this should continue.

This was accepted by Kaufmann who proposed two years as the period.

Bailey objected, proposing 6 months.

Kaufmann then proposed the period of 6 months for the lamp factory and 18 months for the machinery manufactory. This question was left open until the arrival of Mr. Batchelor.

V. The next point was that from the money resulting from the émission proposed to be made an advance payment on account of royalty and profits coming to the Company Continentale to be made by the German Company, the amount of which was to be discussed later.

This was objected to by Kaufmann and Sulzbach.

Question left in abeyance.

VI. Bailey stated that an error had been made by him in the discussion two days before in naming the amount of 15% as parts of founder as to come to the Cie Continentale, and stated that he should be obliged to insist on 20%.

Kaufmann proposed 16⅔%.

Bailey insisted on 20% and the matter was left open for discussion.

November 13th, 1882

Charles Porgos, Esq.

President,

Societe Electrique Edison,

Paris, France.

Dear Sir:-

Will you please deliver to Mr. Charles Batchelor, the Parts of Founder, namely, 3.000 Parts of Founder, of the Societe Electrique Edison, coming to the Edison Electric Light Company of Europe, Limited, and myself under the terms of the Contract of November 15th, 1881.

Yours truly,

November 13th, 1882.

Charles Porges, Esq.

President,

Compagnie Continentale Edison,

Paris, France.

Dear Sir:-

Will you please deliver to Mr Charles Batchelor the Parts of Founder, namely, 8.000 Parts of Founder, of the Compagnie Continentale Edison, coming to the Edison Electric Light Company of Europe, Limited, and myself under the terms of the Contract of November 15th, 1881.

Yours truly,

November 13th, 1882

Charles Porges, Esq.

President,

Societe Industrielle et Commerciale Edison,

Paris, France.

Dear Sir:-

Will you please deliver to Mr. Charles Batchelor, the Parts of Founder, namely, 3000 Parts of Founder, of the Societe Industrielle et Commerciale Edison, coming to the Edison Electric Light Company of Europe, Limited, and myself under the terms of the Contract of November 15th, 1881.

Yours truly,

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 22 Nov 1882.

T. A. Edison Esq.
New York.

My dear Edison,

A short time ago Mr Turutini was here, and in an interview with Mr Borgeo he informed that gentlemen that he bought his lamps for 35 cents from Edison — Is this so? — because Mr Borgeo naturally thinks that if you can affard to let Mr Turutini have them for 35 c, you can sell them to him for the same money.

As I don't believe such is the case, I shall be glad if you will write me, giving me the price of lamps sold to Switzerland.

Yours truly

Ch. Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 22 Nov.^e 1882.

Mr Saml Insull.

65 Fifth Avenue,

New York.

Dear Insull,

I duly received your blue print of base of Armington and Simms' Engine as applied to C. Dynamo, with thanks; - also your acknowledgment of sum paid to Brandon, of 31st October.

I should be much obliged to you if you would kindly send me every alteration and change that you know of in the C Dynamo, with Armington and Simms' Engine attached.

You can easily understand that I am in a hell of a state of mind, with machines on my hands that cost in the neighbourhood 40,000 francs each, which cannot possibly be finished under 3 or 4 months, and knowing all the time that you are making continual alterations in this machine in New York -

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

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EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 22 Nov. 1882

The 3 Screw machines you sent arrived safely to hand, and I must congratulate you upon the choice you have made.

As regards the payment for monthly shipment of glass, I will take care that you receive cheques regularly.

Yours truly

Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 24 Nov. 1882.

T. A. Edison Esq.
65 Fifth Avenue
New York.

Dear Edison,

The contents of one of your Telegrams to the Société Electrique, in which you spoke about the English sockets, was rather puzzling to them. They knew nothing about these sockets, and although I know all about them, I have never given them any information —

I have had enquiries from the Manchester Comp^y and all the other Companies, asking me to manufacture for England, but have replied to all that although manufacturing largely here, our business is such that we are ourselves under the necessity of ordering heavily from America, and have advised them to do the same —

One thing I would ask you, and that is, if you reduce the prices of anything for England, let me know and also give the benefit to the European Companies as well —

Yours
Batchelor

Grand Hotel
Brighton nov 25/82

Thomas A Edison Esq
New York

My dear Sir

I have finished my work here, and shall stay probably a few weeks longer in order to train some men to take charge of the plant. Everything works smoothly and well, the people being pleased. You no doubt have heard of the incident that happened about two weeks ago, when it was intended to open the Theatre and the regulator not being quite finished had to postpone it. I objected from the first not to open untill everything was finished, but Mr Ross who being a little weaken by pressure thought it would ~~would~~ work temporary, and at the last moment was convinced that it was far more prudent to have it all finished and in a permanent

condition than to risk a temporary arrangement. The regulator works very good and I had Prof. Columbo from Milan here on Sunday showing him all the points in a theatre installation. He told me he intended to use a carbon resistance for his theatre in Milan having only about four points to regulate on; After having seen our regulator, he saw it was best to have one of german silver and will get one made.
Our steam engine and dynamos work very well. I may say that one of our dynamos was crossed with the base when we received it from New York but has not yet caused us any trouble. We have been running now about 12 days at an average of 5 hours a day and I must say in that time we have lost about 150 lamps.
I have sent you by post a view

of the theatre. I wish to ask you if I should remain in Europe or if I could go back to the laboratory and there experiment again as my desire for experimenting is as great as ever. Please let me know and oblige

Your humble servant

Francis Jehl

Société Industrielle & Commerciale Edison

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON.

designer
ce N° 1880 Ivry-s/-Seine, le 27 Oct. 1882.
sur ref. facture

M. T. A. Edison
65 Fifth Avenue
New York

Veuillez nous envoyer

Send us 200 of each kind of lead cut outs similar to the ones I saw that were brought by Patterson and were punched out I saw only 600; 1000, & 1300 lights but I suppose you have many more

VEUILLEZ NOUS ACCUSER RÉCEPTION DE CETTE COMMANDE ET NOUS DIRE LA DATE PROBABLE DE VOTRE LIVRAISON.

pour la SOCIÉTÉ Indus.le et Comm.le EDISON.
Le Directeur.
Chas Batchelor

12

Nov. 28. 82

Porter with copy
Porter to Columbo

73 West 50th St
New York City
28th Nov. 1882

T. A. Edison Ph.D.

My Dear Sir:

I persuaded Professor Columbo to adapt a new governor to his engines at Milan. The governor has been finished some three weeks, and my intention was to make two and test them at the station on Pearl St. My own opinion is that they will fill the bill.

Mr Morrill, however, first refused to allow more than one to be finished, and on account of not getting pay from the machine Company has finally refused to let that one go out of the works to be tried here. I have urged him with the block and experiment, but he is firm, and I have no resource except to write the facts to Prof. Columbo. On next page I give you a copy of my letter to him. Yours very truly

Chas. S. Porter.

(Copy)

Dear Sir:

I some time ago completed the governor which I purposed applying to the engines which drive your dynamos. But I regret to say that on account of the long neglect of the Edison Machine Company, in violation of their express agreement, to pay the second moiety of the price of those engines, the President of the Southwark Foundry and Machine Company has absolutely refused even to allow the governor to be sent to the Edison Station in New York for trial, and has permitted one only to be made.

I am quite powerless in the matter, and can only send you this advice, and a copy of it to Mr Edison, which I this day have done.

Signed Chas. T. Porter

Inasmuch as you write Colonel that Porter's statement are untrue, that the engines are not according to Contract & we are going to throw them all out & sue Colly a Damn

Grand Hotel
Brünn Nov 30 / 82

Thomas A. Edison Esq
65 Fifth N.Y.C

My dear Sir

I have been notified from Mr Batchelor that you wish me to omit such notes in my articles that pertain to the "why and wherefors" of your system. It is not my object to do anything that you do not desire, by motive in writing the articles is for the promulgation of your system and name. That in the article in question I do not see anything that would be anti-interest to the Edison Company. In your article that appeared in the "American Machinist" some months ago were substantially all the advantages of your large dynamos, giving reason &c. It grieves me that I have displeased you and will in future take

particular care in whatever I write. You cannot imagine how your name has spread in in these regions since the installation of this theatre. Everyday there are visitors from Vienna and other cities in the vicinity, we have had Societies and commissions and ever since the installation is going the newspapers are full of the Edison Light.

The machines work very well and the machinist that runs the Engine takes care of them already, when we have the whole theatre on the machines give no visible sparks at the brushes.

I leave to night for Dantzig on the Baltic where there are two installations on German man of war, but which do not work well. I will see what is the matter with the machines and set them right and return to Berlin.

Yours sincerely
Francis Jehl

No 381

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le

Dec 1st 1882

Thos A Edison Esq 65 5th Avenue New York

My dear Edison,

I do not know whether you have noticed that some of our lamps (I speak of those from America for I have now remedied it in mine) are actually short circuited in the plaster socket — I could not believe at first that such a thing could happen until I came across no less than three in the lamps at the Brium theatre — I put them in my pocket for investigation as I could not understand how they could come out of your testing room marked 110 volts with a dead cross in the socket I cut them carefully to pieces after making sure of their resistance and I found No 1 crossed at X — No 2 was touching as shown though when I had cut the plaster away sufficiently to see inside they did not look as if they quite touched — No 3 touched as marked —

Fig 1

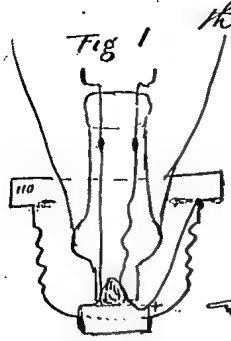
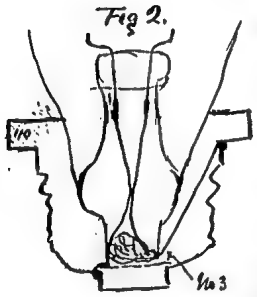


Fig 2.



I would also ask to have better varnishing on the lamps that come to Europe — the moist atmosphere goes into the plaster — I notice

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

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Grand Diplôme d'honneur PARIS 1881

2 Ivry-sur-Seine, le

that you put no varnish on the bottom part of the plaster but it is very essential here. Since finding these crossed lamps I have carefully investigated those lamps which suddenly explode (a phenomenon I have never explained satisfactorily to myself) and in many cases I believe it's due to the wires being very close together, ~~and~~ a little extra current being sent through sometime expands the wires in the shank, and as they are held tight in the seal at one end, and the plaster at the other, they move sideways and touch ——

Dampness in the Plaster will account for high volt lamps in some cases — My volts used to range up to 112 but now I keep all my lamps at about 90 Volts for 2 days before varnishing and testing and now I very seldom get one above 106 or 107.

Yours truly

Chas Batchelor

Explosion is due I think to arcing
We have fixed the wires in inside pay
by using insulated wire = will tell
upton about varnishing
There must have been some change in your
carbonization to bring volts down as Upton Cant
see how a drop of 2 volts could take place in the

will probably be sufficient to set the wine off in few days —

I have just got a new Compound that I think will be good for sockets of lamps instead of plaster paris that tried it = an Italian stick mica cogether which does splendidly = We roughen the mica pieces with sand paper & punch few holes in pieces then with these we build up anything we want by putting thinly over mica the stuff = Bingmann is going to make moned try if we cannot mould the sockets by placing mould — its Common Oxide Magnesia mixed with saturated solution Chloride of Magnesia, there may be several times to our bulk of meat stuff mixed with it such as finely powdered Sand Emery Etc = It sets in 12 hours harder than marble — I send sample —

Boiling saturated solution of Chloride of Magnesia with 10 cubic centimeters of oxide of magnesia to 10 grammes of oxide of magnesia. You can experiment on proportions of oxide to chloride to suit yourself.

Mr Mortimer

28

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

ADRESSE TÉLÉGRAPHIQUE
EDISON, PARIS

Paris, le 1st. December 1882.

T.A.Edison Esq.

New York.

Dear Sir:

Yours of the 21st. November regarding legislation in Italy and Austria for the prolongation of your patents to the full term of 15 years is received.

We do not think it advisable to move in the matter until the definitive Companies in those two countries are formed, after which of course there will be no difficulty in dealing with the question. It is desirable also that the affair should be kept entirely quiet, so that no rumour respecting it should get abroad.

Very truly yours,

COMPAGNIE CONTINENTALE EDISON

Administrateur délégué

384

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500,000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 1 Dec 1882.

My dear Edison,

As regards the settlement of Seubel's Bill to you, I have accepted payment in the following manner:—

He will give me cheques, dated one month apart for 250 francs each, payable by the Société Electrique, and I will collect the money and forward it to you.—

~~Of course~~ Seubel acknowledges that he is ~~by no means so~~ prompt in returning the money ~~as~~ you were in lending it to him, but owing to the fact of his having lost one of his children, and with continued sickness in his family, he really has not the money to pay you, and can only get it by working for it,

~~Believe me~~

~~Yours very faithfully~~

[redacted]

No 386

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, 5, RUE DU PARC.

le 2 Dec 1882.

T. A. Edison Esq
New York.

My dear Edison, I send you a small box today in which is enclosed a Deprez Galvanometer for measuring volts — Also two of Doctor Brady's briquettes — I will give you a few notes on each in a day or two,

Yours very faithfully
Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

No 389

Ivry-sur-Seine. le 5 Dec. 1882.

5, RUE DU PARC.

T. A. Edison Esq.
New York.

My dear Edison, I confirm my cable of this morning as follows:

Edisonio - New York.

"Send thirty sheets sixteenth fibre obey beauty" —

I have used up all the 16th fibres the agents had in London, and they give me no hope of being able to get any more. If you have not sent this by the time this letter arrives, please hurry some forward; otherwise I shall be at a stand-still.

I have already had to make the little washers and sockets, both of hard rubber and horn, through not being able to get this —

I sent you by mail 3000 dollars —

I don't know how your account stands yet. Exactly, but as soon as we have straightened

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine. le 5 Dec. 1882.

5, RUE DU PARC.

Our office matters, will send you Cheque for the balance -
I have just been obliged to discharge my Bookkeeper, and the new ones are going through all the Bills, and payments since we started
They hope to have all completed in a few days, when you will receive cheque —

Believe me,
Very truly yours
Chas Batchelor

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ
Grand Diplôme d'honneur
PARIS 1881

Ivry-sur-Seine. le 11 Decr 1882.
5, RUE DU PARC.

T. A. Edison Esq.
New York

My dear Edison,

I have just received a letter from our Agents, Messrs. Laude & Filo at Havre, of which the following is a translation

"I am unable to forward you cask of tubes arrived by Steamer "Labrador" from New York owing to the deplorable manner in which it has been packed.
Contrary to all rules of common sense and the most elementary technical rules, the vertical height of the Cask is less than the length of the tubes —
Consequently they have been arranged diagonally, leaving a great space filled up with nothing whatever ; neither paper, nor straw —

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le 11 Decr. 1882.

5, RUE DU PARC.

2

"It is true that afterwards some pieces of strong paper have been added, imperfectly filling up the interstices between the different parcels of tubes, but not sufficient to prevent a large amount of breakage, for which the "Compagnie Transatlantique" cannot be held responsible —

An authorised valuer will be instructed to make a proper report which will be duly sent to you, and which you can use, as you may think fit, against the forwarders of the goods —

We shall repack the tubes which remain, and deliver them to you by the ordinary route"

From the above you will perceive that there has been great carelessness in packing these tubes — I notified you before that in one your shipments of tubes, almost everything was

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1,500,000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, 5, RUE DU PARC.

le 11 Decr 1882.

3/-

broken -

I wish you would take care that positive instructions be given to Upton or whoever packs these things, so that this shall not occur again. -

We sustain a great loss in all the tubes, and if it were not for the fact that they are cut in short lengths we could not make use of them at all,

Believe me

Very truly yours.

Chas Batchelor

Société Électrique

SOCIÉTÉ ÉLECTRIQUE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR

ADRESSE TÉLÉGRAPHIQUE
EDISON, PARIS

Paris, le 13th. December, 1882.

Enclosure

Ans 27 Dec 82

T. A. Edison Esq.
65 Fifth Avenue,
New York.

Dear Sir:

Last July we sent Mr. Acheson to Italy. Until about a fortnight before sending him, his salary had been Fr. 500, when on sending him to Holland we raised it to Fr. 750, with an allowance of Fr. 8 per day for expenses. It was on these terms that we passed him to the Italian Company, he continuing our employe, and we debiting them with the sum above named. When I met Colombo at Brunn three weeks ago, he told me that Acheson had, in his absence in the States, struck on the Committee at Milan for Fr. 1500 a month, and that they being afraid of getting into trouble through his leaving had yielded to the demand.

On my return to Paris we wrote Mr. Acheson and the Italian Company requesting Mr. Acheson to return us the money that he had collected from the Italian Company in excess of the amount for which he had engaged with us, and at which we had passed him to that Company; and to them requesting them to debit us with the amount paid in excess of the amount at which we had passed him to them inasmuch as we had recommended him to them as possessing our confidence

and commended him to theirs. We told Acheson that unless he did so, that he might consider himself as discharged from the employment of the Edison Company, and requested the Milan people to discharge him from theirs also in our mutual interest, so as to protect ourselves from similar operations by others. They have not yet discharged him, but we understand from Mr. Shepherd, who has just come from Milan, that Acheson talks of returning to the States, and we write you this to post you regarding him should he do so.

The negotiations with Siemens & Halske are still progressing, and herewith enclosed you will find a memorandum that they submitted to Professor Colombo as the bases for an understanding in Italy.

Batchelor and I go to Frankfort tomorrow night to meet Siemens & Halske and our German Bankers, to discuss the terms of the understanding, but you may be sure that no such terms as those proposed to Professor Colombo will be accepted by us.

Very truly yours,

COMPAGNIE CONTINENTALE EDISON

Administrateur délégué

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR
ADRESSE TÉLÉGRAPHIQUE
EDISON PARIS

33 Avenue de l'Opera, Paris,

18th December, 1882.

T. A. Edison Esq.,

65 Fifth Avenue, New York.

Dear Sir:

We have this morning received a letter from the Committee of the Italian Company complaining of the commission of one-quarter per cent. which we have charged to them on your invoices, to cover the commission charged by Mr. Wallerstein. They had previously written to us on the subject, supposing that this commission was charged for our benefit, and we replied explaining that this was not the case. They write anew this morning, and we reply that we send to you their reclamation.

We cannot pass such a charge to the Compagnie Continentale inasmuch as it has no profit on the material furnished, but acts as simple intermediary between you and the Italian Company. Please to write us fully on this point, and do the most in your power to satisfy our Italian friends who, we understand, think this amount of a quarter per cent. commission should be credited to them.

They also write us regarding the governors for the Porter Allen engines, saying that Professor Colombo had a direct assurance that the governors should be changed; that they have just received a letter from Mr. Porter announcing that he has not been able to

keep his engagement because Mr. Edison had not yet paid for the second half of the engines ordered from from him, as these engines have been recognized as defective; that we have debited them for the full price of these engines; and that they have the right to reclaim the new model governor as now manufactured by Porter Allen; and that they hold us to the same reserve that Mr. Edison has made to the Porter Allen people, and hold us responsible for the proper working of these governors, and of the possible necessity of changing them. We have replied to them that Mr. Bailey remembers perfectly that there was a question between Professor Colombo and Mr. Edison as to these governors, and that his recollection is also that Mr. Edison engaged that the new governor should be furnished, without additional charge, if found necessary to the proper working of the engines.

We beg your prompt attention to this affair. You know how much the Edison interests will be affected by the result of the Italian Central Station now forming; also, whatever may be the situation between you and the Porter Allen people, it is essential that you put the Italians right, as the amount involved for you is of little consequence in comparison with the smooth working and good understanding with the Italian people. Notwithstanding all our contracts, our hold on them, as well as on others with whom we have similar contracts in Europe, will depend quite as much on the impression of entire good faith and promptitude in keeping engagements, as on the force of the contracts themselves.

Professor Colombo stated to Mr. Bailey at Brunn on the occasion of their meeting there that the payment of your bills in advance, with no possibility of verification of the amount, and the closing of the door to any reclamation except such as you might be disposed to admit, has given a good deal of offence, and created some bad feeling among the Bankers at Milan who are on the Committee of the Edison affair, and that he had had great difficulty in getting them to accept this system.

Bailey explained to him the reasons for it, and assured him that they would be placed in no position of prejudice through this system of payment, and enlarged on your entire good faith in all affairs of business. The Italians have gone ahead with great enterprise, and Professor Colombo himself, as you know, has taken great personal responsibilities in advance of any demonstration of the good working of your machines for Central Stations, and even at the moment when certain difficulties were fully recognized as existing.

We beg you out of regard for your own interests to let no delay occur in giving what we have no doubt you will recognize as fully as we just satisfaction in the matters herein set forth.

We cabled you yesterday "Arrange governors Italian machines as important," hoping that from this you may be able to put in train what is necessary in advance of receiving this letter.

We have called your attention to the complaints regarding the B. lamps in our letter of the 8th. instant addressed to Major

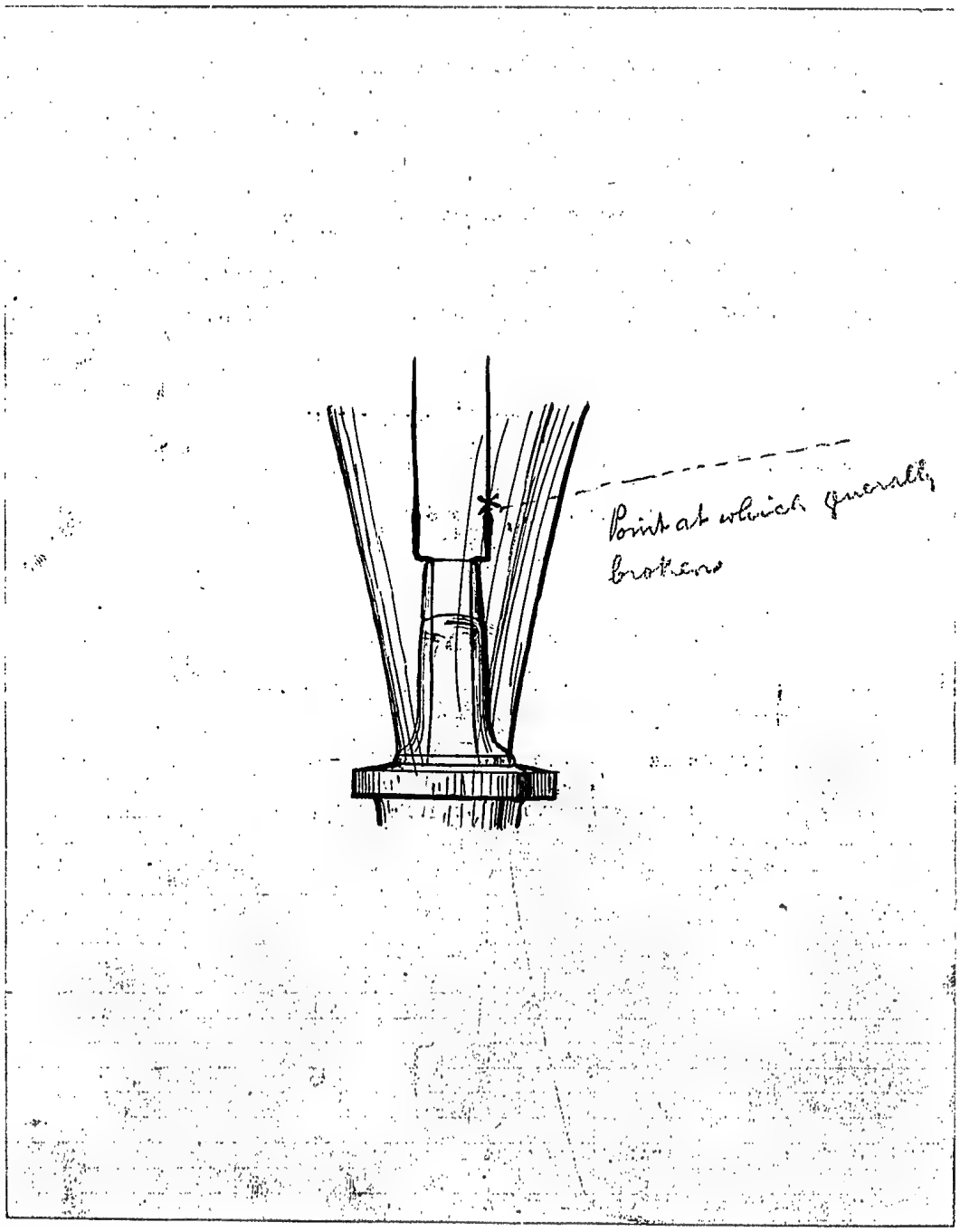
Eaton. We receive also complaints as to the A.lamps sent to Hamburg, the inside glass tube of which is stated to break very easily; and we enclose a sketch of a lamp with the point of rupture of the carbon marked thereon, which is stated by the German people to be almost invariably the position of the break in both A.and B.lamps.

Very truly yours,

COMPAGNIE CONTINENTALE EDISON

J. H. Bair

Administrateur délégué


Point at which generally
broken

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR
ADRESSE TÉLÉGRAPHIQUE
EDISON, PARIS

33 Avenue de l'Opera, Paris,

20th. December, 1882.

T.A.Edison Esq.

65 Fifth Avenue, New York.

Dear Sir:

Since Bailey's return from the States we have no newss regarding the 100 candle, the 50 candle or the 10 candle lamps. It is very desirable that you keep us posted regarding developments in these directions.

Also we are without definite advices as to the working of the regulators in the Central Station, and those that we have are calculated to inspire doubts and hesitation. Major Eaton mentions in one of his letters that the Central Station works well except that there is a variability in the machines.

Mr. Patin told us on his return that there was always need of employing mercury for the brushes, and both he and Mr. Lieb spoke of certain difficulties with the governing apparatus, which, taken in connection with the other advices that we have, are such as to leave a liberal margin for doubt on the part of persons requiring to be convinced.

We have not yet been able to bring up the matter of the appointment of a correspondent especially for reports to us of what passes with you.

We have constantly had matters of discussion that do not give a basis for propositions of this sort.

We have at this moment pending negotiations for Germany and in Austria, in which it is the desire to establish Companies that are simply Societes d'Eclairage without any obligation to limit themselves to the exploitation of the Edison system. Mr. Porges and some of our other Administrators have difficulty in realizing that Companies constituted in this way would not have any great value for us, inasmuch as the apparatus of the Edison system would be substituted by infringements or evasions, for the purpose of escaping the payment of royalties and other advantages stipulated to the Compagnie Continentale.

Mr. Porges with a certain reason is very desirous of securing advance payments in which we are entirely of accord with him, but he desires to sacrifice conditions that we find to be essential to the preservation of the Edison interests by giving them to these Societes d'Eclairage of which the Edison affair is simply an incident and not the object. The negotiations built up with very much care in Germany with Mr. Siemens and the German Bankers are at the present very much compromised by the violent methods taken by our Council at the instance of Mr. Porges, and which we have been unable to entirely prevent.

Mr. Porges was at our office today, and desired, in order to get the payment of the Fr. 400,000, to sacrifice the conditions above referred to by us as essential. We advised him that we should

insist on this, and that no contract would be ratified by the Light Company in which they were not maintained.

You will find it difficult to believe that even today so small a sum as Fr. 300,000 or Fr. 400,000 as an advance payment on account of royalties and advantages stipulated to us for the whole Empire of Germany constitutes a serious and perhaps fatal objection to the execution of a contract. We consider the making of this payment an Ultimatum and preventing merely the constitution of a powerful Company, especially in view of a possible fight with Siemens a simple absurdity; but the putting of the Edison interests in a "Societe d'Eclairage" with no obligation to the exploitation of the Edison system in order to get out Fr. 400,000 seems to us so enormous an absurdity that it is not to be thought of.

We will keep you advised of the progress of the affair, and meantime shall be obliged by the expression of your views as to the maintenance of the conditions we have named as in our view essential.

Very truly yours,

Charles P. Bailey

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

405

EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 20 Dec 1882.

Mr A Edison Esq 65 5th Avenue

My dear Edison I received your and Eatons joint telegram "Have not founders shares been shipped" to which I answered immediately "No abdomen (Bailey) wanted settlement with abluton (Leon) will be finished this week"—

This matter being settled I immediately wrote Porges for a rendezvous with himself and Leon — It is not appointed yet but I understand Mr Bailey had an interview with Porges after which Bailey told me that I must not receive the shares until he had an answer to a letter to Eaton written the 19th —

The founder's shares are all made "au porteur" or to bearer and I think Bailey fears that if they pass into my hands even though for the company, M. Porges and his friends would take advantage of the 3rd clause in article 5 of the Statutes of the Compagnie Continentale.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le 3

This I think is altogether too cautious for in the first place I do not believe these people capable of such meanness and then again I do not see how they could prove that the Light Co had disposed of them — I have sent a note again asking Mr. Forges if 20% of these shares could not be delivered to me in the name of the Light Co and the rest "au porteur" so that I can immediately settle it

Very truly yours

Chas Batchelor

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR
ADRESSE TÉLÉGRAPHIQUE
EDISON PARIS

16 Jan 83

33 Avenue de l'Opera, Paris,

20th. December, 1882.

S.B.Eaton Esq.

65 Fifth Avenue

New York.

Dear Sir:

Referring to the conversations had with Messrs. Armington & Sims in New York and in Paris, we beg to say that during Bailey's visit to Germany he was requested to get models of each size of their engines, and a contract was proposed to be made with Messrs. Armington & Sims for the manufacture of their engines in Germany on the basis of the payment of 5 per cent. royalty as long as the patent rights should remain good. The royalty of 10 per cent. is one that will make it entirely impossible to make any general arrangements for the manufacture of their engines either in Germany or elsewhere in Europe. The margins of such business are not large enough on this side the Ocean to support such heavy payments for patent rights, especially where the foundation is so uncertain as it is in all matters relating to steam engines.

If messrs. Armington & Sims accept an arrangement on this basis contracts can be made in Germany and France at once with a leading manufacturer, binding him to manufacture no other fast-speed engines except the Armington & Sims and to make delivery on

terms as may be agreed on.

If this proposition meets the approval of Armington & Sim they should send us at once the models desired or duplicates of them, and we will put in train contracts in the sense above referred to for their approval.

We cabled you under date of the 12th. instant to ship two Armington Engines for use in Belgium. These engines are for the lighting of the Theatre of the Park, and the Cercle Artistique at Brussels.

If Messrs! Armington & Sims do not wish to accept the terms above proposed, we can do business with them in countries where their engines can be introduced without vitiating the patents on the basis of purchase, but this will not be nearly so advantageous as a general arrangement for the payment of a 5 per cent. royalty which would engage us or our contractants to further the application of their engines not only for electrical installations, but for general use.

Awaiting your advices regarding this,

We remain,

Very truly yours,

COMPAGNIE CONTINENTALE EDISC.

J. T. Baile

Administrateur Délégué

Berliner Börsen-Zeitung 23 Dec. 82

Comparing electricity to Gas Mr. Edison himself speaks as follows in the New York paper „World":

„Neither the production, nor the sale of electricity for lighting will be a competition to gas, at all events not more than petroleum, the price of the electric light being higher than gas. We charge 1 1/16 cents = 4,7 ₰ for 16 candle-lights an hour. Electric light is about 1/3 higher & our customers pay 1/3 more for electric light than for gas."

If Mr. Edison states that the electric lighting by incandescence is 1/3 higher than gas, we are to take note that the price of gas in America is nearly double the price as in Germany.

Comparing the price of gas at Berlin at 16 ₰ a ☐m, of which 100 litres as an average are consumed an hour to give a light of 10 candles, the consumer pays 1,6 ₰ an hour; but, according to Mr. Edison's own statement he would have to pay for an electric incadescent light of the same strength, 4,7 ₰, that is to say three times more.

p. t. o.

And whether the Edison Central Station at New York will even at this price which is 3 times as high, be able to pay, is a question of time.

Albany 22.83

Gas Continuation
with
Sandalz Collitt

C. G. C.
"T. A. G. told me
to send this to you
Samuel
26/12/82

[ATTACHMENT]

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

Grand Diplôme d'honneur PARIS 1881

Ivry-sur-Seine, le

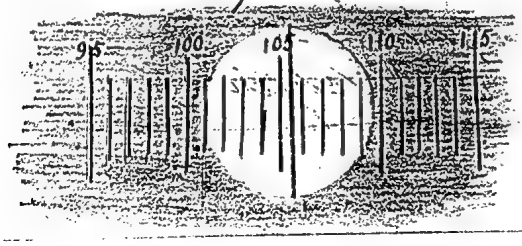
Arrangement of the Deprez's Galvanometer used at Ivry's Edison Factory for lamp's tests.

The Galvanometer had a resistance of 525 Ohms. In order to increase that resistance in leaving at the same time the deflection such as it was possible to read the fractions of volts, we have arranged it as below:

We have put on the needle axle a small concave mirror in order to project the deflections on a transparent scale at a distance of one meter (3ft 3in 3/8).

We have put in the galvanometer circuit a resistance box, variable from 5 Ohms in 5 Ohms to 3000 Ohms (12 bobbins: 5, 5, 10, 10, 20, 50, 100, 100, 200, 500, 1000, 1000 Ohms). In adding by that means 2650 Ohms in the Galvanometer circuit, we have obtained a deflection of 36 centimeters (14in 3/8) for 125 Volts. We have divided by experiments the scale in Volts, in order to have direct readings.

In putting before the scale lamp a metallic wire and a plano-convexe lens, we have projected on the scale a circular spot as below:



full size.

[ATTACHMENT]

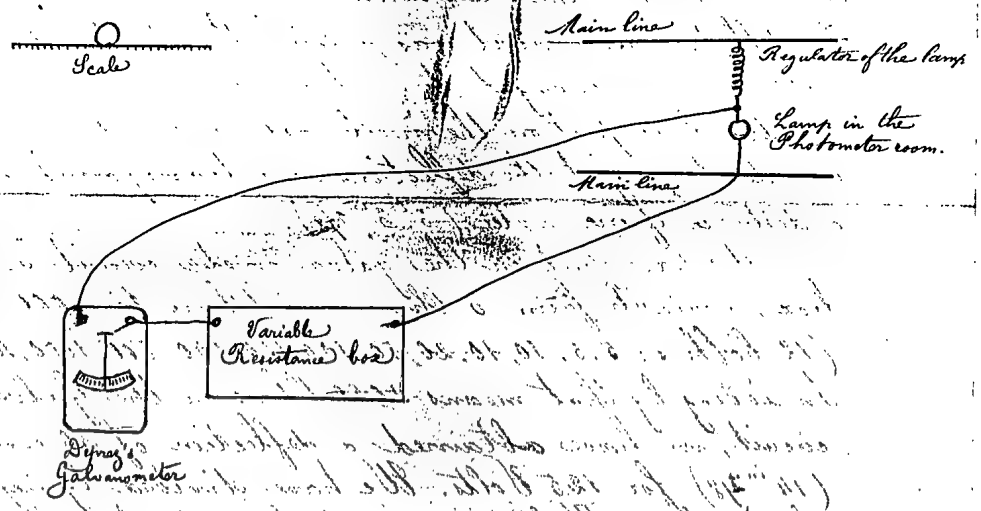
4

Galvanometer
Bastien

The part lighted shows the divisions on a sufficient space to make no mistake and the wire gives a very exact reading. We have put also three screws to the instrument to in order to make easily the regulation of the spot.

These different improvements permit to test the electro-motive forces of the lamps exactly and very quickly.

Connection's diagram for a lamp E.M.F. test.
with Deprez's Galvanometer.



The galvanometer at our factory (now used 2½ months) gives no difference from when first started, we verify continually.

Yours
Bastien

Cie CONTINENTALE EDISON
SOCIÉTÉ ANONYME
Au Capital de 1 million de francs
EXPOSITION INTERNATIONALE D'ÉLECTRICITÉ
Paris 1881
GRAND DIPLOME D'HONNEUR
ADRESSE TÉLÉGRAPHIQUE
EDISON, PARIS

33 Avenue de l'Opera, Paris,

31st. December, 1882.

T. A. Edison Esq.

65 Fifth Avenue, New York.

Dear Sir:

Referring to our letter of the 18th. instant regarding the governors for the Porter Allen engines furnished to the Italian people we have received from them another letter of which the following is a translation:

"As to the matter of the governors we learn by a letter "from Mr. Edison to Professor Colombo, dated the 6th. inst. that:

"The machines furnished by the Southwark Foundry & "Machinery Co. are not in accordance with the Contract, "and as soon as Mr. Edison can have other machines, he "will take out the present machines from the Central Sta- "tion at New York."

"In a former letter Mr. Edison says that the

"Porter engine does not work well, and the only "thing that is lacking still at the Central Station is "the substitution of the Armington & Sims engine in place "of the Porters now in use, the Armington & Sims engine "not only having the regularity that is lacking in the "Porter engine, but is much more economical."

"It seems to us in presence of these declarations, from "which it results clearly that Mr. Edison has protested the Porter "engine in declaring it unacceptable to such a degree that he has "refused to pay the second half of the price agreed, that we have "also the right of protesting it. We bought the dynamos complete, "and they were given to us as perfect, and we have paid the entire "amount for such machines, while now Mr. Edison himself declares "them defective.

"This, then, is what we should think of doing. Because "of engagements taken we ought to put in operation the soonest pos- "sible two of the dynamos. We could for the moment install two "of them with the Porter engines, and replace these immediately with "the Armington & Sims engines when they are sent to us in substitu- "tion, the two others also to be changed to complete the installation. "Please then to tell us at what date we can have the two first Arm- "ington engines, and, if possible, the other two. We request your "earnest attention to this important question. If you desire we "will send you complete copies of the letters of Mr. Edison."

We cabled you on the 26th inst. on receipt of the above letter asking at what date you would change the Porter engines. We are without any reply to this cable, and shall repeat it tomorrow unless an answer is received meanwhile.

Very truly yours,

COMPAGNIE CONTINENTALE EDISON

J. F. Bailey

Administrateur Delegue.

per A.J.L.

E

engaged [illegible]

Acheson is in Holland for several days past making installations and also perfecting plans for central station in Amsterdam.

Meanwhile inclosed please find copy of notice of first lighting up of plant at Muxlegan Italy, [illegible] long [illegible] which was burned to a cinder by

[illegible] of the Holland [illegible] contract, [illegible] "[illegible]" [illegible] of these contracts.

Holland, the gist of [illegible] in central stations a royalty of 20 cents per lamp in campin[illegible] electric stations and [illegible] price [illegible] provided for installations, [illegible]

The Holland company [illegible] officers [illegible] the [illegible]

[illegible]

The Italian syndicate
proposes with a capital
of duration up to 31 Dec 83.
It has a capital of
3,000,000 francs, [illegible]
[illegible] a factory [illegible]
a central station [illegible]
Milano, Palermo, Genova,
here the [illegible] to make
[illegible] the affair
[illegible]

[illegible]
We have received [illegible]
from Rome [illegible] Italy
and we send you certificates.
The conditions of contract
are (1) [illegible] capital
of [illegible] (2) royalty
of 3% centimes on all
[illegible] sales [illegible]
[illegible] (3) Royalty [illegible]
[illegible] material

Naples; the Credit Mobilier Italien; the House of Pacifico Cavalieri of Genoa; the Banque Franco-Italienne; the principal establishments of the State; the Banque Nationale; the Banque Ottomane; the Banque Hypothécaire; the Banque Générale; the Credito Lombardo; the Banque de Milan; the Credit Italien; the Banque Commerciale Italienne; the Banque Hypothécaire

employed in installation, in short, it is proposed the intention is that the Company shall carry on the manufacture, exploitation, & the Company shall be formed for the manufacture, use, & sale of the product, the patent, the secret of the contract, the Bank General, the Credito Lombardo, the Banque de Milan, the Credit Italien, the Banque Commerciale Italienne, the Banque Hypothécaire, the Banque Générale, the Credito Lombardo, the

[illegible]

9

to be named as one of the directors of the Italian Company representing the Company Continentale.

Mary Garbis health would not allow of his accepting the invitation to come to Bologna. He remained at the sea shore & his physician not allowing his coming into the interior. Bailey therefore wrote him fully confirming the above, to which

There has not been time
to write safely.
[illegible]
[illegible]

[illegible]

[illegible]

to Eaton –

no date –

(1882)

Edison:-

Hopkinson has allowed to Bailey that his meter will not register at all for 1 lamp.

Hopkinson has patents in Germany for 3 wire system before us, so I have written to Hanford asking copies of the distribution patent you sent there to get round them

I wired you to stop the Galvanometers at Bergmans as I cannot take them just at present

"Batch"

P.S. I cabled for models to Berlin because I assure you unless we can promise Siemens something to manufacture from we shall go to pieces altogether Of course they know that we have had 500 lamps from the H and they are quite satisfied to take that H in fact further delay will I assure you but no in that direction

CB

Elec. Lt. Italy. 1882

Points of Contract proposed to Professor Colombo by

Messrs. Siemens & Halske.

First. The contract will be made with the actual owners of the Edison Patents, but should engage also the future proprietors.

Second. The Edison Company for Italy to use only the Siemens machines and lamps for arc lighting, and these will be supplied by S.& H. at a reduction of --- per cent on current prices:

Third. Messrs Siemens & Halske to use for incandescent lighting only Edison lamps, which are to be supplied by the Italian Company at a reduction on their prices current. only for Isolated

Fourth. Nevertheless S& H. reserve to themselves the right of employing their own machines with the Edison lamps and their own materials, and no reclamations shall be made upon them under the Edison patents regarding the details of such installations.

Fifth. The contract to last as long as the Edison patents continue.

Sixth. Siemens & Halske reserve to themselves the right to employ in Italy any other incandescent lamps on payment of a royalty of ---per cent on the value of the lamps. By the payment of this royalty S.& H. to have the right to use for their installations and sales all the Edison patents having relation to lighting by incandescence.

Seventh. The Edison Company to institute without delay suits against all parties making installations in Italy on other systems.

Eighth. The incandescent lamps to be sold by the Italian Company and Siemens & Halske at the same price. The commission

to be paid to S.& H. to be equal to the royalty of the inventor, so that it shall be possible for them to sell the lamps at the established prices at a moderate profit.

SOCIÉTÉ ÉLECTRIQUE ÉDISON

SERVICE TECHNIQUE

CIRCULAIRE N° 3

Paris, le ..... *1882.*

Monsieur ..... **Ingénieur.**

Lorsque vous voulez actionner une machine Édison de 60 lampes A au moyen d'un arbre tournant avec une vitesse donnée, vous obtiendrez la vitesse voulue de 1200 tours à la dynamo, en donnant aux poulies les dimensions inscrites dans la table ci-dessous.

Vous remarquerez que pour des vitesses de l'arbre inférieures à 300, il faut un renvoi.

Exemple : *Supposons que l'arbre A ait une vitesse de 150 tours, vous pouvez prendre :*

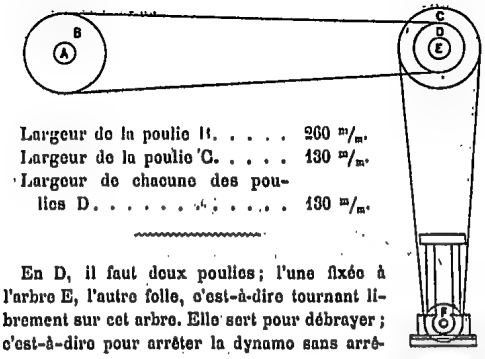
Pour B une poulie de 900 m/m, pour C une poulie de 900 m/m et pour D une poulie de 150 × 2.7 = 405 m/m.

Ou encore pour B une poulie de 800 m/m, pour C une poulie de 750 m/m et pour D une poulie de 150 × 2.0 = 300 m/m.

Supposons maintenant à l'arbre A une vitesse de 360 tours, vous pouvez vous passer de renvoi en mettant sur l'arbre une poulie de 833 m/m.

TRANSMISSION POUR MACHINE DE 60 LAMPES A.

NOMBRE de tours de l'arbre A	DIAMÈTRE en millimètres de la poulie sur l'arbre B	DIAMÈTRE en millimètres de la grande poulie du renvoi C	DIAMÈTRE en millimètres de la petite poulie du renvoi D
			Multiplier le nombre de tours de l'arbre par :
60 — 150	900	900	2.7
120 — 250	800	750	2.0
200 — 350	750	600	1.5
300 et au-dessus.	Diviser 300000 par le nombre de tours de l'arbre	Pas de renvoi	



Largeur de la poulie B. . . . . 260 m/m.
Largeur de la poulie C. . . . . 130 m/m.
Largeur de chacune des poulies D. . . . . 130 m/m.

En D, il faut deux poulies ; l'une fixée à l'arbre E, l'autre folle, c'est-à-dire tournant librement sur cet arbre. Elle sert pour débrayer ; c'est-à-dire pour arrêter la dynamo sans arrêter le moteur.

L'Ingénieur en Chef,

CH. BATCHELOR.

Petit-Jean. PARIS IMPRIME. — 1414.5.82.

MODÈLE N° 5

SOCIÉTÉ ÉLECTRIQUE EDISON

SERVICE TECHNIQUE

CIRCULAIRE N° 5

Paris, le _____ 188

Monsieur_____ **Ingénieur**

Vous êtes prié de prendre note très exactement, de tous les défauts que vous rencontrerez dans le matériel ainsi que de tous les accidents qui pourraient survenir; pour les porter à notre connaissance.

Vous voudrez bien indiquer la provenance des objets défectueux et avariés (Paris, Anvers, Hambourg, etc.) ainsi que leur numéro de fabrication. Vous exposerez les motifs qui pourraient entraver le parfait fonctionnement de votre installation, et les causes auxquelles vous attribueriez un accident qui viendrait à se produire.

Un bulletin devra être dressé par vous, signé, et envoyé à la

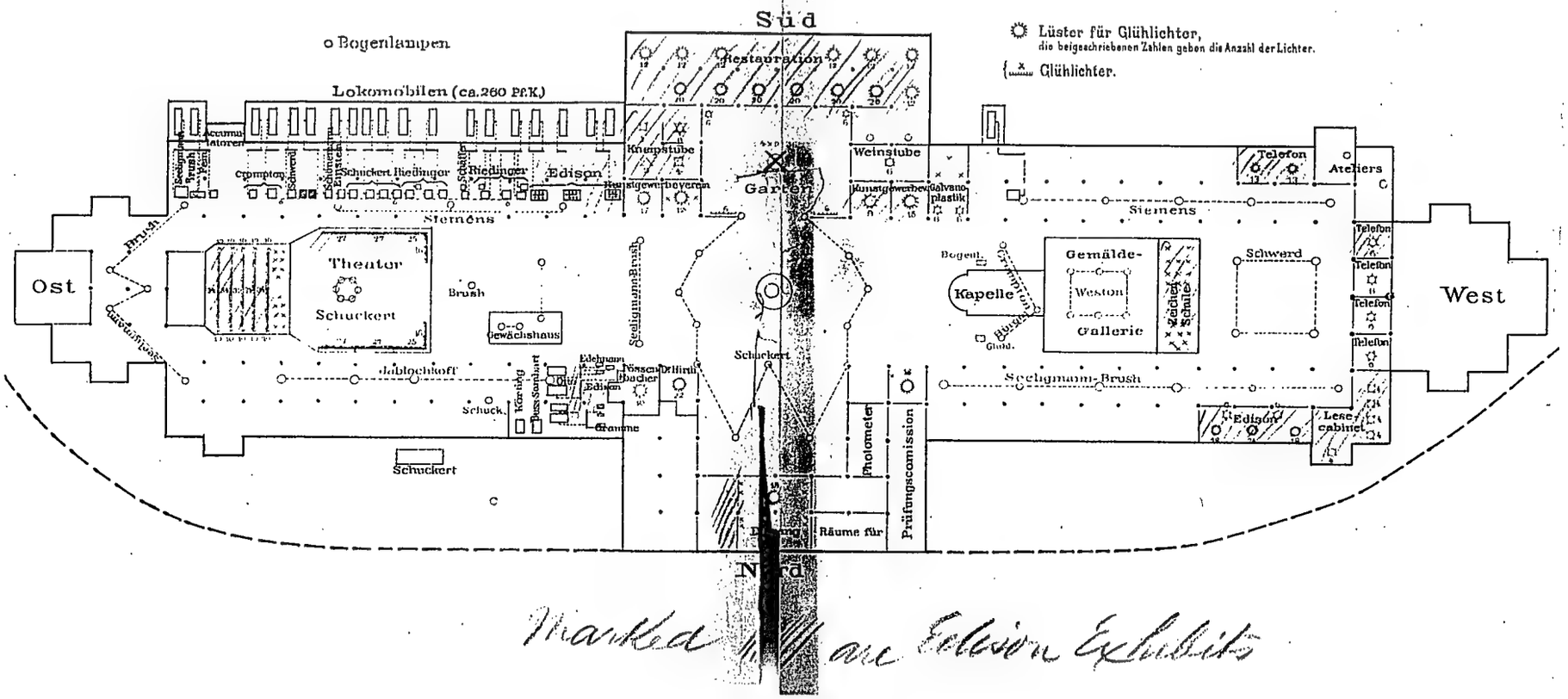
SOCIÉTÉ ÉLECTRIQUE EDISON
SERVICE TECHNIQUE
33, *avenue de l'Opéra,*
PARIS.

L'Ingénieur en chef,
CH. BATCHELOR.

2063 — Typ. A. Lahure, Paris.

Filed: D 1882 "Exhibitions"

Die elektrische Beleuchtung im kgl. Glaspalast zu München



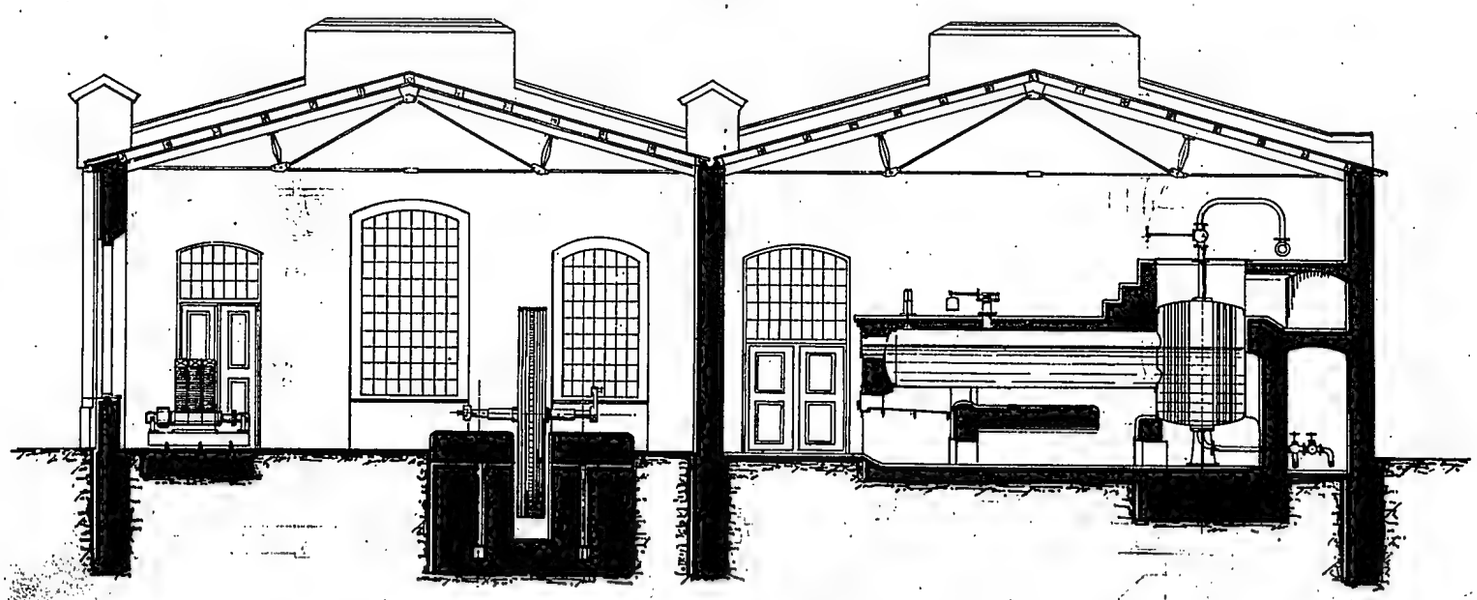
Marked ||| are Edison Exhibits

MASCHINELLE ANLAGE
ZUR ELECTRISCHEN BELEUCHTUNG UND KRAFTÜBERTRAGUNG
FÜR DAS BRÜNNER STADT-THEATER

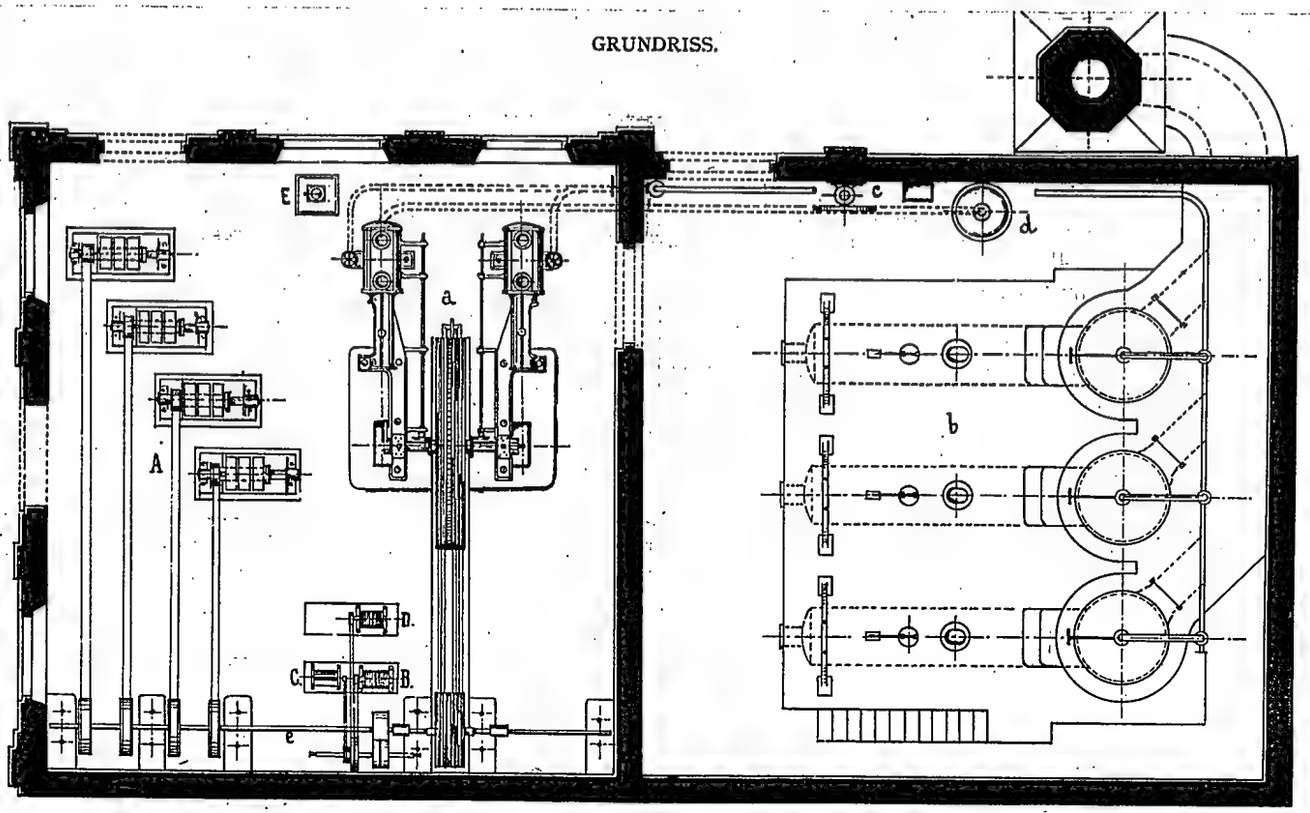
ELECTRISCHE BELEUCHTUNGS- und KRAFTÜBERTRAGUNGS-ANLAGE
ausgeführt von der SOCIÉTÉ ÉLECTRIQUE EDISON in PARIS
und BRÜCKNER, ROSS & CONSORTEN in WIEN.

KESSEL- und DAMPFMASCHINEN-ANLAGE
ausgeführt von der
„ERSTEN BRÜNNER MASCHINEN-FABRIKS-GESELLSCHAFT" in BRÜNN.

LÄNGENSCHNITT.



GRUNDRISS.



A. Dynamo-electrische Lichtmaschinen für je 250 Edison-Glühlichter.
B. Dynamo-electrische Maschine für die Aussenbeleuchtung (5 Bogenlichter).
C. Dynamo-electrische Maschine für die Bühneneffectbeleuchtung.
D. Electro-dynamische Maschine zur Kraftübertragung.
E. Strom-Regulirungs-Apparat.

a. Zwillings-Collman-Hochdruck-Maschine.
b. Dupuis-Kessel.
c. Speise-Vorrichtung.
d. Vorwärmer.
e. Seiltransmissionen.

BRÜNN, im Dezember 1882.

1882. Electric Light - Foreign - United Kingdom - General (D-82-039)

This folder contains correspondence, agreements, reports, and other documents relating to the Edison electric light system in the United Kingdom. Much of the correspondence is by Edison's associate, Edward H. Johnson, and by Arnold White, secretary of the Edison Electric Light Company, Ltd. Some of the documents deal with the Holborn Viaduct central station, the Electric Lighting Act of 1882, and the Manchester & District Edison Electric Light Company, Ltd. Included also is a printed pamphlet by Francis Jehl, "The Edison Electric Light Meter." Related material can be found in the Records of the Edison Electric Light Company, Ltd. (Company Records Series).

Approximately 70 percent of the documents have been filmed. The following categories of documents have not been filmed: bills of lading and lists of goods shipped; duplicate copies of selected documents; copies of cable messages filmed in Letterbook, LM-001 (Letterbook Series).

Enclosure

Dual

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWARD H. JOHNSON, MANAGER.

57, Holborn Viaduct.

London, E.C. January 6th 1882

Thomas A. Edison Esq.
65 Fifth avenue
New York

My dear Edison

I enclose you a copy of a letter from Sir William Thomson in response to my last one to him in which I took occasion to say that having made up my mind that the Dynamo which I loaned him should not leave his laboratory until he had either condemned or endorsed it. I now had to propose that I come up to Glasgow and that together we make tests of the apparatus and also of his Siemens SD2 machine and that he should give me the results of his findings. I told him that it was necessary that I should have these figures in order that I might use them in connection with the business of selling these small dynamos

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as their cost to us was such as to ~~establish~~ prohibit our competition with Siemens, Gramme and others upon the basis merely of price, that the superior economy of our Dynamos must not only be asserted by us but that we must be able to prove it on his authority. This was a bold step to capture Sir William in view of the fact that ere my arrival in England Col Gouraud had written to ask him if he would act in this very matter and that he had replied he was sorry he could not do so etc, etc, etc. I told W. Fabbri that I would get secure the services of Sir William and I now beg you to read his letter and see whether or no I ~~had~~ have not succeeded. I shall of course make a regular business arrangement with Sir William and shall so interest him in the work that he will be insensibly carried from one ~~leader~~ stage to another until he will find himself eventually wholly committed to the Edison System. If I succeed in doing so I think Thomas A. Edison and C. P. Fabbri

3/

will owe me no grudge. Sir William's ~~[illegible]~~ about winding the armatures with silk ~~[illegible]~~ springs from a supposition of his that the trouble with the bar armature machines was in their destruction by centrifugal action. I am somewhat of his opinion. I was present in Paris at the time the bar machine gave way; in fact, I was standing but a few feet away at the time, with Batchelor. I saw the — occurrence — Batchelor didn't. We immediately made such an examination as was permitted by the general debris produced and I am not of the opinion that the cause then circulated, namely, that a piece of something had got into the armature, is correct. The engine was just starting up and is a huge powerful affair, ~~that~~ I think gave the armature such a wrench as to cause it to give way.

In view of the stride in the right direction the Siemens SD2 machine is making I am of the opinion that it would be advisable for you to make a few of these bar

4 Dynamos and if possible and one one for Crystal Palace for the purpose of testing. I should like above all things to be able to show Sir William such a machine and to get his professional opinion on it. Do you not think it worth while to give this matter your ~~opinion~~ attention? You can certainly now eradicate readily enough the defects which exist in the former ones. While in Glasgow I shall have the opportunity as you will see by Thomson's letter of learning some particulars about the Swan lamps and they will be I imagine the most favorable that Swan can do inasmuch as he would unquestionably send to Sir William only his best lamps. On this head you have probably heard that the Savoy Theatre is now fully lighted by the Swan lamps, that is to say that they have finally succeeded after many months in lighting the Stage as well as the auditorium. I went there the other

caught and took a box so as to be able to get an inside view of the stage and what I saw rather pleased me than otherwise. The foot-lights were a number of lamps varying from three to twelve or fourteen candles and when they were turned down many of them gave no light at all while others were actually incandescent, and ranged along between these two extremes, was every shade of red possible in a lamp. Up among the scenery were several rows of these lamps placed together as close as possible, and there the same lack of uniformity existed. Many of them were out and at the extreme rear of the stage I noticed a flickering light which I knew coned only come from gas. I therefore carefully watched the transformation of the scenery in order to get a glimpse of the source of the light and I presently discovered a number of gas jets, thus the assertion that the house is now wholly lit by electric light is false — some gas jets being

still in use. I understand D'Oyley Carte has gone to America. Perhaps it would be a good thing if you could get hold of him while there, & you could say ~~something~~ ~~now~~ things in regard to Safeguards against fire, Faure batteries &c &c which I as your representative would not dare say here. You could then ask him to come and see me on his return to England. I think this is the more important, as I understand that he is very much dissatisfied with the present arrangement.

Viaduct. I am all ready with the exception of ~~a few~~ one or two pieces of exhaust pipes to run my Dynamo, a few days more and I will be ~~running it~~ turning it round as a Steam Engine but as I have said before I will not put on the current except just to test the circuits until my other Dynamo arrives. Not having heard from you for some days I telegraphed you to day ~~for~~ to know the present status

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I was only able to get the contract with the city ready for signature the latter part of last week, and even then having to ask that my name be substituted for Mr. Fabbri's I was subjected to another delay and succeeded only in getting it signed, sealed, and delivered this week. I am therefore now putting my conductors in the subway and connecting up the various shops and street lamps with the same. I will not attempt to explain to you causes of delay which have so extended the time of getting this plant in operation — you must draw on your imagination for them. The surveyors of the various Insurance Companies with whom the shops are insured are paying me their respects and I have considerable to do to satisfy them that there is no danger in fact this matter has become so important

8/ that I have been compelled to write something upon the subject. I sent you today some newspapers in which you will find an article from my pen. I purposely omitted such allusion to our enterprise as would give the article the character of an advertisement but its great length prevented me from getting it into the "Times" and it finally went into the "Advertiser" by reason of my agreeing to take a considerable number of copies of the paper. If you want more than I have sent you, I have an abundant supply and can send them. I presume it will raise some discussion, if it does I will send you whatever appears. Please send me some more copies of your Circular to the Board of Fire Underwriters suggesting rules for their adoption, also send me a number of copies of Count Du Manoelle's article. I am sending you hereafter

9

40 or 50 Copies, of anything I consider of sufficient importance to lay in a stock of for my use, and I trust ~~have~~ you will do the same by me. Your letter for additional Copies of Greece's letter is receiving attention. The Society of Arts people made me a present of 50 Copies which are now exhausted. I tried to buy an additional number but could not get them. I have therefore taken the article and put it in pamphlet form and, having 500 Copies printed, ~~and~~ they will ~~have them~~ be done in a few days when I will send you 50 or 100. Greece's other two lectures to the Juveniles at the Society of Arts were very satisfactorily lit by us. You will see a report in the "Advertiser" (page 3) of last night's lecture. You will notice that my Chandelier is again enlarged. This is the small one; the big one

that I will shew at Crystal Palace will make a sensation.

Crystal Palace. I am almost ready to start up one gang of my Crystal Palace plant and light with it the large concert room requiring about 210 lamps. In this concert room I have a magnificent crystal chandelier especially designed for the incandescent lamps — I think it will be very effective. Then around the galleries, which are very high I have suspended festoons of lamps in pockets with which I calculate to produce a very fine effect. Underneath the galleries I have astride of some gas chandeliers, a number of four burner attachments into which I shall put half lamps. My idea is to start up with this gang (one third of my entire plant) as soon as possible and be the first to shew incandescent ~~lamps~~ lights at the Palace.

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The Light and Power Generator Company (The Maxim crowd) have lit up a few Weston lamps I presume in order to be able to say that they were the first to get into operation at the Palace. As these are arc lamps of course the installation was exceedingly simple and they were able to make it in 48 hours. All incandescent plants, however, are considerably behind us, and we shall be the first. If we are I shall telegraph you the fact, and when I do telegraph you can rely on the correctness and accuracy of the information. I meant to keep you posted in regard to Crystal Palace in such reliable way as will enable you to answer positively any mis-statement that may be made by Maxim or others. The other two gangs of my plant will not be ready for a week or a fortnight after the

12/ first gang but I believe that I will be wholly in operation with my large plant before any of the others are working at all, and besides will have by many times the finest exhibit at the Palace, although I understand all the other parties are going to out do their Paris exhibit.

Gas Engine: Sterne has not as yet got his gas engine to work entirely satisfactory but he was able with Hammer's assistance yesterday morning to keep 40 or 50 of our B lamps perfectly steady and very brilliant during a visit paid him by the Prince of Wales who took much interest in both the gas engine and the lamps. Hammer handed to his Highness one of our B lamps and he seemed much pleased with it and examined it very carefully. Siemens was with him and I presume played such cards as he was able but I fancy from what I hear that His Royal Highness is quite competent to form a judgment for himself. It seems that Sterne is not yet able to work his gas engine up to its limit and keep the thing steady. However as Sir William Thompson is having one made with special governors for regulating it especially for — incandescent lights I will have an opportunity when at Glasgow to note its efficiency. —

Faure Battery. — This concern is fast going to pieces; there is no one in attendance at their headquarters except the menials and the thing is generally neglected. Our lamps

were bobbing up and down all last week to such an extent that they excited comment and on a report reaching me that the persons in attendance gave as an explanation that the Edison lamp was not as steady as the Maxim I went down and interviewed one of the chiefs on his return from Paris where he had been for a fortnight. He told me that they had not been working the lamps from their battery but had been working them from the gas engine direct (an Otto) and that as soon as he arrived he had ordered the thing to be stopped at once. I gave him to understand that unless it was stopped I should be compelled to make a public explanation. At this he flared up and desired me to understand that whatever might be the law in America regulating such matters in England I would render myself liable to an action. I told him that I was entirely responsible for anything I might do. I have heard nothing whatever of the other "Accumullator" as yet. Sender has gone to Egypt and I have not been able to see Briggs.

Lamps. I am frequently asked the question whether or no

we are willing to guarantee the life of our lamps to be a certain number of hours and if so what? How I should like to be able to do this here, at least, for our own isolated plants in case I should put some out as I early contemplate doing. What have you to say on the subject, laying aside the lamps that I now have what might I name as a guaranteed average of the life of say each 100 sold with an isolated plant. The lamps to be new ones that you are now able to send me. Of course I understand that such guarantee would only be upon the average life and only then when the plant is supplied with one of your E.M.F. regulators.

Gowrand. I spent some time with the Duke during the holidays and had long conversations on Telephone and Electric Light matters. I have been intending to write you a letter giving the purport thereof but I have not had time and will even now have to postpone it as I have more writing to do than I can get done within the next few days but I shall certainly make a letter to you on this subject in a very short time.

Telephone. The great "carbon transmitter versus microphone"

we are willing to guarantee the life of our lamps to be a certain number of hours and if so what? How I should like to be able to do this here, at least, for our own isolated plants in case I should put come out as I early contemplate doing. What have you to say on the subject. Laying aside the lamps that I now have what might I name as a guaranteed average of the life of say each 100 cold with an isolated plant, the lamps to be new ones that you are now able to send me. Of course I understand that such guarantee would only be upon the average life and only then when the plant is supplied with one of your E.M.F. regulators.

Howard. I spent some time with the Duke during the holidays and had long conversations on Telephone and Electric Light matters. I have been intending to write you a letter giving the purport thereof but I have not had time and will even now have to postpone it as I have more writing to do than I can get done within the next few days but I shall certainly make a letter to you on this subject in a very short time.

Telephone. The great "carbon transmitter versus microphone"

Trial is to come off in Edinburgh on the 24th of this month. Sir William Thompson, Sir Frederick Bramwell, Professors Tyndall, Fleming Jenkins, and myself are the experts called to testify on your side; the whole array on the opposite side will be mediocre but will be supported by the influence of the Post Office. A question has arisen as to whether or no you had in mind the phonograph as now made when you took out your July 77 patent. We have reason to believe that an attempt will be made to show that you had not - that you only then contemplated recording and that you had no idea of reproducing the record, but that you subsequently conceived this idea and worked it out and that therefore you are endeavouring to hold something not contemplated under your provisional specification. I have been asked to say what I know on this subject and I have replied to the effect that I was present when you originally conceived the idea of recording the telephone vibrations and that you remarked at that particular moment of time that you would reproduce the same by causing the record to be drawn past the needle and that you used paper in the first ~~instance~~ trials for this purpose and further that the thing bears upon its face.

proof that you so contemplated in that no record possible with a ~~the~~ diaphragm could be deciphered by the eye and therefore you could not contemplate recording ~~unless~~ ~~cant~~ ~~without~~ at the same time contemplating the reproduction I further stated that the idea of recording and reproducing sprang from your knowledge of the action of a Morse recorder and your application of that instrument to both recording and transmitting telegraphic characters and that the recording of the vibrations of ~~the~~ a diaphram and reproducing the same was so analogous to the operation of your Morse operator that you could not but see ~~that~~ ~~the~~ the fixed dual operation of the device you described in the patent ~~as~~ I have also called attention to the fact that Mr Batchelor is on this side of the water and that he was present at the time and will be able to make deposition as to the facts which deposition we can use at Edinburgh. I have today telegraphed you ~~as to~~ to know what ~~are~~ your recollections are as to the date of the manufacture of the first phonograph and to ask you to forward to me all my early lectures on the subject notably those in which I predicted that you would

make a talking machine. If you forward these things promptly they will arrive in time and may be of great service I have also asked our people to call upon Col. Stewart Worley at the South Kensington Museum and see if he has not the first phonograph in his possession and the date of its manufacture thereon. (I have since found that the 1st Phono was one which recorded on a V boss on paper - & therefore Col Worley could not be the first 27/1/96.)

Preece. I trust you will on receipt of Preece's lecture have sent me something for him in the form of a letter of thanks; it would be the correct thing for you to do and would materially assist in creating that better feeling towards you which it is important for us now to foster besides I know you are ever willing to shake hands with a man who ~~advan~~ acknowledges, however indirectly, that he has been in the wrong. His position with the Government I am sure is the only thing which prevents him from making this acknowledgement to comprehend the Telephone. He was much gratified to learn from me that you were so pleased with his lecture that you desired an additional number of copies of it, and I am certain that a letter from you to him or a message through me would greatly delight him.

Edison. - There is something which I think it only fair should be said. I have noticed in the short time I have been on this side that when you get into that ~~shutter~~ strata which is above and beyond the atmosphere of self-interest there is an invariable recognition of Edison as the discoverer of the modus operandi by which the Electric Light has been sub-divided. I have seen allusion to your name in two novels (which I did not further read) and one scientific work (which I likewise did not read) and at a play at the Gaiety Theatre called "Alladin" allusion was made by one of the actors to the lamp of Edison and among the men of good standing with whom I have come in contact in a social way (I have to do some little of this sort of thing) I find that the incandescent lamp is universally recognised as yours. The petty issues involved by patent tests will not be sufficient to cloud this fact and I am satisfied that wherever ~~by~~ the light is seen by an unprejudiced eye it will be recognised as Edison's whether it be actually made by Swan, Lane Fox, Maxim or other innovators (Modern ~~Ex~~ THIEVES.)

Parliamentary Bill. In this matter we have all joined hands; the 6 Companies applying for powers have united in a common cause to save expense and in the course of the procedure it has been adjudged wise to notify the "Corporate ~~Boroughs~~ Boroughs Association" who represent the various Municipal Government of England that we contemplate asking Parliament to grant powers to them and not to us independently of them. This has been done for the purpose of anticipating their opposition and it has worked well in all respects save one which concerns us only. That is that they object to our being a party to the Petition because we have no recognized organization. They say that our future licensees are too undefined - that they might be individuals of no sufficient responsibility. They therefore ask that before we proceed further we shall form an organization. This has put Waterhouse in a stew inasmuch as he does not know how to act. If we withdraw the other 5 will be happy as they will have us,

at a disadvantage. On the other hand if we remain in we have to risk the opposition of a Corporate Borough Association which would again render our opponents happy. In view of this condition of things and of the necessity of doing something at an early date I telegraphed you and received from you a telegram which seemed to me (reading between the lines) to demand of me something additional upon which you could reach a decision as to Fabbri's negotiation. I went to Waterhouse and asked him this question: "I want to ask you whether on the whole you are today not more sanguine as to the validity and general strength of our Patents than you were when Dr Fabbri sailed?" I gave him no intimation that I wanted this information for other than my own satisfaction. He replied that without being able to say why (as we had no further reports either from Bidwell or Johnson) he yet felt more sanguine of the

ultimate outcome than he had heretofore — that my successful combat with Bidwell over the question of the functions of radiating surface and of resistance had satisfied him that these matters were ~~xxxx~~ not understood by others as they were by you, but beyond this he could not say that we were any stronger today than when Mr Sabin left. Bidwell is making an exhaustive report of the ~~xxx~~ remaining Patents but that will not be ready yet for some time. We are at present discussing the question of presenting to Webster for his opinion Patent No 5 with a presentation of the issues that Bidwell Johnson and myself are now ~~complete~~ able to make and getting from the Q.C. an opinion. To this proposition I reply that Webster can only give an opinion after he has been thoroughly "coached" and that that would require some time. I am therefore wholly unable to give you the reply which I know you would like to have, namely an Emphatic affirmative. I have purposely

refrained from any attempt to bias your decision in this matter for the reason that I cannot myself reach a decision. I sometimes think it would be better to accept and then again that we had better not. In view of this even balance I take the ground that we should accept on the condition that the $25.000 is made 50.000. I so wrote Mr Fabbri on December 23rd and being of the same opinion today I cabled you referring to that letter and to the effect that my opinion was unchanged. I would like to help you come to a conclusion but I feel myself unequal to the task. You and I recognise and feel that there is a vast difference between your work of today and that of others but all the same we must accept the conclusions of the men whom we set the task of forming an opinion on our Patents. I will leave no stone unturned to convince these men that our claims are well founded but it is up-hill work. You

25/ You will see by an article in Labouchere's "Truth" that the general opinion is that all Electric Light Patents are invalid. One thing is absolutely certain and that is that an amount of opposition will be brought to bear against us at every turn we take in the Courts unparalleled in the history of any of your Inventions. As to the men who make the proposition to you I am sanguine that no better can be found. The old Edison Telephone element will be more likely to hold this thing with a firm grip by reason of the fact now recognized that they were scared into a premature throwing up of their hands in the Telephone; besides this they have determined to bring into the thing some more vigorous and stronger men than they had with them in the Telephone. Such additional men would have been secured ere this but for the fact that I have cautioned Waterhouse against committing himself insomuch as "I do not believe the Proposition taken out by Fabbri will be acceptable to Edison". —

I have also called Mr Waterhouse's attention to the fact that you are making rapid strides in the direction of higher economy by improvement in the lamp and by improved efficiency of your dynamos, and that in consequence of this, your opinion of the value of the thing will be greatly enhanced. His reply to all this is of course a natural one, namely, that anything you may do in this direction will act directly upon the value of your shares. Of course to this I retort "Yes, but all the same its effect is to create in Edison's mind a dissatisfaction with the bonus advanced". In short I am doing and saying whatever occurs to me to prepare their minds for rejection of their proposition. Of course all this will arrive too late for your guidance but I want you to know the

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reason why I have not asked you straight out to accept or to reject.

Patents. — The man Stanford who constituted the brain of John Henry Johnson's establishment has dissolved partnership with that concern and is about to set up for himself. A more thorough and painstaking man it would be impossible to find and Waterhouse and I as well as Gaurand agree that no better man in all England can be found to entrust your Patents to. I sincerely hope that you will have recognised the wisdom of my suggestions and that you will authorise me to employ this man to take out all your Patents for in the future. I think the plan would be to have Wilber prepare them as far as he can and then transmit them direct to Stanford who will exercise his knowledge of the requirements of

the English Patent Law in further preparing them for filing. If I am not very much mistaken this will give to your future Patents a strength their predecessors have not had

Very Truly Yours

Edward N. Johnson

Late of U.S.A.

More to follow as soon as my man catches up to me -
It is impossible for me to duplicate all this stiff copy you must let Mr Gabbi have the benefit of it -

Yours Old Friend

Sam H. Ge

[ENCLOSURE]

Copy

January 2nd 1882

Mere Old Hall,
Knutsford

Dear Mr. Johnson

I shall be very glad to see you in Glasgow and to show you all I am doing in my small installation of Electric Lighting, and what measurements I can make of the Efficiency of Dynamos with the power I hope to have at command in my laboratory (6½ h.p.). I hope to hear on Thursday when I shall be in Glasgow that the Gas Engine is quite ready, and possibly to see a beginning of setting it up in its place but I return to England on Friday and am not to be in Glasgow again till this day week, when I hope to go on without check and with only two or three days more delay get my lighting fairly started. I shall let you know when this is the case and you will let me know what time would be most convenient for you to come. I shall be much interested in trying the Edison Dynamos as thoroughly as I can and letting you know the results, or making measurements with your assistance if we can arrange to do so when

[ENCLOSURE]

2

you come.

The resistance of the armature in my Siemens "SD2" is ·2 or ·21 of an ohm, and of the Electromagnet as nearly as I can recollect 14 ohms, or about 70 times as much as the armature. This is not so favorable a ratio as in any of the Edison types. But I find I can afford to add a little to the resistance in the Electro magnet and still get 110 volts without running at more than 1200 revolutions, and so get good economy with from 3½ to 4 ohms of resistance in the external circuit. I found I could excite two of your B lamps in series or one A, amply. The unit which Siemens gives me is 30 amperes which corresponds I believe to 30 of your A lamps or 60 B's in parallels of 2 each. I expect to be able to do as much as this with my 6/4 h. p. Gas Engine. With more power at command there is no difficulty in running the Siemens D2 at 1500 revolutions (Sir W. Armstrong has run his Siemens' D2 at that rate without any extra guard against centrifugal force. I propose

[ENCLOSURE]

3

to wind mine tightly round with silk thread such as I use for my compass, which bears 7 lbs, and not to stop at 1500 revolutions but to run up to 2000 when I can get the power. There will, however, be the question of potential to be met. – will 150 or 200 volts not break down the insulation in the structure? Similar trials might I think be made, with prospect of advantage, with the Edison A and B Dynamos.) I intend in my laboratory, lecture room, and house, to have one pair of mains from the Dynamo which is close to the laboratory, and branch pairs of wires in the rooms of the house, with multiple bridges, each bridge being of one "A" Edison or 2 "B" Edisons or two Swans, or three Swans of a smaller kind. Each bridge is made or broken independently of the others by a simple little hand make-break tap which I have made for the purpose. I have also automatic regulators to maintain constancy of incandescence of the lights in use when others are thrown on or off. All these ~~appreciators~~ appliances I hope to be

[ENCLOSURE]

4 able to show you in action when you come and if I can help you in any way in respect to the testing and advantageous working of dynamos, whether by suggestions or by any experiments I may be able to make I shall be glad to do so.

Believe me,
Yours very truly,
(signed) William Thomson

P.S. I had not heard that the Dynamo which Mr Batchelor showed me in Paris had broken in pieces. Would not a complete silk thread binding avert such an accident on any armature similarly made? If the mechanical difficulties can be overcome it ought to give splendid results with such figures as those that Mr Batchelor gave me. I shall have the resistances measured in the Dynamo you sent me, when I get it into my laboratory. The electro magnet coils were joined in series. There were some faults as to modes of attaching

[ENCLOSURE]

5 terminal pieces (leaving them too fragile) which I had to cure roughly extempore by resoldering. I shall shew them to you when you come, but it is well perhaps you should know meantime that you may let some of these details be looked to in any you may have in stock or be receiving from New York.

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct,
London, E.C. Jany 8th 1882

My dr Edison

I presume you have seen this test of Batch's - as I had several copies of it made however I send you one - It's not a very exhaustive treatment of the matter but it serves a purpose in showing that at least it could be done to compete with Gas at the selling price - my tests will be more complete because everything will be taken into a/c -

I am just in receipt of another letter from Sir Wm T. - here's a copy + Glasgow Journal &c

Dr Mr Johnson

I am off this moment

for England to return on Monday I saw Mr Clerk yesterday & he promised me my Gas Engine next Wednesday He tells me it performs somewhat more than 6 Horse Power on the belt. This will be ample for my own lighting - but is not sufficient to do justice to the A. Edison Dynamo - a portable Engine might be brought into the neighborhood of my Laboratory but not conveniently & only very temporarily I think my friends the Mercantile Firm whose new offices are to be lighted soon - Messrs Wm Graham & Co - (no connection with Messrs D. G. Graham whose name you may possibly know in connection with Electric Lighting) would have ample power and I think if you desire it they would allow the A Edison to be placed beside the Siemens Dynamos and permit a thorough test to be

3/ Made of all 4 machines in their Place. I shall be glad to know your wishes on this subject & if you wish it I would speak & then verify any such an arrangement could be made.

Yours &c

Signed Wm Thomson

To this I have replied that I do wish it & consequently expect to go up to Glasgow in a day or two. This Siemens machine is the only one we have to compete with & I can show ours is a cheaper machine for one year - at 150 £ than it is at 90 £ - then I can sell ours at 150 £ - but not more - we have got to face this fact - unless you can produce still more favorable results by substituting the Bar armature. Now you see why I want you to send me a Bar armature machine I will get Thomson so alive to his arm in these tests - that he will agree to come down to

4/ London on its arrival & test it.
I also want a motor badly
I don't want to confess we have
no motor - It was all well enough
to explain its absence at Paris
- but that won't work at Palace
We must have one or two of you
can produce them at all in
accordance with your notions
of what you ultimately expect -
I also want meters - Have you
anything in view that is an
improvement on the thing that
I have? My impression is that in
view of what Francis was able to
do with them at Goerck St. I
had better not put them up -
- It now for 8 days since I heard
from you on new Dynamo - and
get nothing from you, even in
response to my Cables - so I con-
clude new Dynamo gone up
in a blaze of glory be Damned

5/ Let me know - what its weakness are - so I may avoid them intelligently & not give them away by reason of my ignorance

- I have an A Dynamo running regularly at the works of Messrs Hayward Tyler & Co - my Engineers - gave it to them to run & light their place until I got some going - so I might have one in operation that I could show to people - Its about 10 mins from my office - The Faure Battery people have another on loan but as that is used for charging their Batteries I am not able to show it at work - Thomson Stone & Co - Clerks Gas Engine Manfrs - have another at the Smoke abatement Exhibition South Kensington Museum But that only supplies about 30 or 40 B Lamps, if they are to be held ready - It can do more but only at the expense of readiness - (Tells for 100

If He will be disappointed in this Gas Engine giving him 6 Horse Power as the makers themselves cant get their 6 H.P. out & keep the thing steady - but Thomson seems sanguine so I am waiting till I see him before I definitely conclude it a failure - some record to placing a fly wheel on the Dynamo - but I dont like that Idea - I dont know whether Sir Wm so intends or not - (Sir Wm - is not the "Thomson" - of Thomson Stone & Co - no connection) -

Then I sold one to Robey & Co the men from whom I obtained my Crystal Palace Engines got 10 £ for it - 5/ for Lamps - 4/ for sockets &c made a little profit but not much - I can't see for more than that - but can see for that but to be any profit your price must come down - Can you do it? I have several parties standing ready to take machines as soon as I can fix a price and say on authority of Sir Wm T. that they are more economical at that price than any other machine at 90 or 100 £

7/ Consequently I must have more machines - I want 12 at Crystal Palace - & have only 7 or 8 on hand (Sir Wm has one) - The B. machines are no good here - people want more light not less - the atmosphere is so heavy that it takes more light at one point than it does in my - therefore my B machines are likely to remain on my hands - I am putting one up for the Telephone Construction Co in their new shops (150 £) - & may get rid of them if that proves a success - But the A machine is the one we require (unless you make a special lamp & work on the B - but I suppose you would consider that bad policy - Could you make a 16 Candle lamp of 60 ohms & work on B Dynamo Ckt? - I think such a lamp would help sell the B machines - Yours and got bit heavy on his 20 machines & has been relying on my helping him out by taking some off his hands as soon

as I needed more - hence my
Telegram to you & Fabbri - I
went off a little half cocked
in the matter, & rather consented
before thinking much about it -
then recollecting your position
saw what a blunder I had
committed & took the course I
did to get out of it = I haven't
seen him since but I suppose
he will be a little put out at
the failure to relieve him =
I think you have rather got
even with him - though after
all it's probably yourself carrying
the load in another form
I expect the Oriental Payments
to be made this week - will
promptly advise you when
made

Yours truly
or as the English text is

January 8 M Edison most faithfully Yours

Chas. A. Johnson

[CONTRACT WITH EDWARD P. BOUVERIE?]

9th. January, 1882

Proposed cable to London as to Edison Electric Light agreement for Great Britain.

Edison accepts agreement as proposed with following changes,

Clause Third,

Add:- Provided such issues do not effect the right of " B " shares to one half the profits after paying a five per cent dividend to " A " shares provided in fifth clause.

Clause Fifth,

Add:- Provided that the amount of subscribed " A " shares shall not at any time be entitled to cast more than twice the number of votes which the entire amount of issued " B " shares are entitled to Cast.

Clause Seventh,

Add:- And fifty per cent thereof paid up within days from the same date.

Clause Ninth,

After " same " insert:-to the use of electricity for light heat and power. After Edison insert:- The said Edison shall be entitled to reimbursement of all expenses incurred by him in experiments for the production of such improvements with one hundred per cent added and without reference to any compen-

sation which he may receive for the same from other parties.

Clause Fifteenth,

After " roads " insert:- and for all other purposes except the production of light heat and power by electricity.

Clause Sixteenth,

Strike out down to and including " operations " and insert:- The said Edison will until January first eighteen eighty two from time to time with all reasonable dispatch supply to the company at the prices charged by him to his most favored customers all such dynamos and other plant as shall be required by the Company and consistent with his capacity and other engagements, and will also supply all such Electric Lamps as may be required at prices not to exceed fifty cents each for Isolated business and forty cents each where such lamps are to be used in connection with a central lighting station.

Clause Seventeenth,

After the words " accountants that " insert:- In their opinion assuming a given area not less than five square miles and same administrative expenses for both gas and electric lighting and actual investment and depreciation in plants lands and other-

wise for gas and estimated investment and depreciation for the same purposes for electric light that the." After words " has been given " add:- and provided also that in any case of failure or refusal by either said referees to act or decide upon the matters submitted within months of the date thereof the said sum shall be immediately due.

Note,

Mr. Edison can manufacture dynamos and machinery other than lamps only by license of the American Company which refused to give him license except on the condition that he will distribute his work between orders from them and from English company. Impossible, therefore, for him to agree otherwise. He declines to fix any price different from those which he will give to the American Company.

English Sight
Jan 11 82
Waterhouse & Co
Johnson

1, NEW COURT
CAREY STREET,
LINCOLNS INN, W.C.

Jan 11 1882 3

My dear Sir,

Edison's lecture
[illegible] I have this afn.
seen Mr Warren in reference
to the long [illegible] letter
received the morning from
Mr Pettit & should you
have already read it well you sh[illegible] know at
once what I anticipate

little difficulty with any of the alterations in the proposed agreement desired on Mr Edison's behalf - except as to the desired omission of clause 17 (the one relating to the certificate to be given by Sir W. Thomson & Sir J. Maxwell). Mr Barvenie as I anticipated regards this clause as fundamental & I expect that Sir John Lubbock (who is expected back in England in a few days) will view it in the same way.

I am to send Mr Barvenie a copy of the agreement showing the alterations desired - & shall then hear further from him - but I much doubt his seeing his way to the omission of the clause in question.

The alterations in the clause

as the supply of generators
& plant appear to have
objectionable from the picture
Company's point of view, but
under the circumstances stated
in the prospectus unavoidable.

Yours very truly
Theodore Waterhouse.

E. H. Johnson Esq.,
57 Hatton Garden
E.C.

English Light
Jan. 1482

Waterhouse

From WATERHOUSE & WINTERBOTHAM,
Solicitors.

1, NEW COURT,
CAREY STREET,
LINCOLNS INN, W.C.

Jan.y 14. 1882

My dear Sir,
Edison's Patents.

I enclose as arranged for you to forward by today's mail to Mr. Edison a copy of Mr. Bidwell's further Report on the Patents - those relating to the generation & distribution of electricity. The copy is made on half margin, in order that Mr. Edison may

favour us with their comments on the conclusions indicated in the Report. We shd. be very sorry to decide on disclaimers under any misapprehension as to Mr. Edison's own views.

You will observe that the Report does not deal with the new departure in the Patent of the 6th. Aug 1881. (the disk armature in radial sections). This came to hand after the Report had been completed.

We are led to expect great things from this invention, & anxiously await further things & in due time with it in practice.

Yours very faithfully

Theodore Waterhouse.

E.H. Johnson Esq.,
57 Holborn Viaduct
EC

2 Swels

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD. H. JOHNSON,
MANAGER.

57, Holborn Viaduct,
London, E.C. Jany 19th 1882

My dear Edison

I have yours of Dec. 31st now before me and find that there are some things mentioned in it which I did not reply to in my last. All you say about the possibility of a new lamp is very satisfactory and I have made good use of it with my friends but I do not think well of a 10 Candle Lamp. The people in London want more light than they now get, and although 10 candles may be above the average of a London gas burner and therefore a good standard for calculating cost it is not sufficient to meet the requirements of the people who want Electric Light. They are mostly heavy consumers of Gas and have adopted the best burner and in their hands gas consumption is much more carefully looked after than it is in the hands of an average consumer. To illustrate my point – When I was

in England before, London was a very dark place, streets that were lighted with gas were very poorly lighted and numerous shops and public establishments which now are exceedingly well lit, were then very dismal indeed. The Electric Light has caused a change in all this. Sugg and Bray and lastly Siemens have brought out improved burners and the Argand burner is coming very extensively into use. The result is that many of the principal streets, nearly all the leading shops and many of the large public establishments are as brilliant now as if lighted by a superior light, though of course this improvement is not effected without increased consumption, but on the other hand this increased Consumption is made to yield a much greater unit of light than owned the same Consumption a year ago. Take Siemens new burner for instance; he claims (I do not know whether right or wrong) that by means of it he gets 25 Candles of light from 5 feet of gas but in order to do so he must

burn in his lamp from 10 to 20 feet of gas. The Economy is thus only effected by a large increase of consumption. I do not know what Sugg and Gray claim but I do know that many of the principal streets are magnificently illuminated by means of a number of their burners aggregated together in a single lamp running from 3 to 6 burners per lamp. All the improvements seem to be simply in the direction of increased consumption thereby securing higher Economy. This increased Consumption affects us of course in another way namely the gas output is maintained on one street by just that which it loses by virtue of the Electric Light on another street. My opinion is therefore that it will not do to rely too much upon the statistics which were prepared a year or two back.

About Meters. I shall be glad to see Francis. The absence of the meter is the only drawback to the completeness of

4/ our system. I do not want any large meters. Meters from 1 to 20 lights will be quite sufficient. I have one establishment in which I put 175 lamps and I have two or three in which I put 50 lamps. These latter I presume I can accomodate with the 20 light meters unless you can send me a 50 light. The first I will not attempt to measure at all.

Holborn Viaduct Centre. I did propose to run my two Dynamos at the same time taking the current from them both and thus calling upon them for only half of their capacity. It strikes me that this would ensure reliability inasmuch as these big machines when doing but half their work will be of course much less liable to stoppages. I want to run all the time one machine from say 2 or 3 O'clock in the afternoon until about 5, then starting a second and running the 2 together until about 7 or 8 and then stopping the first and running the other

until morning. I will in this way never call upon a machine to do its full quota of work except in case of accidental stoppage of the other and in that case will be able instantly to throw it out of circuit and draw upon the other for additional power. Is there anything in the way of doing this. I would not like to have a stoppage of my lights even for so short a space of time as 20 seconds it would throw everybody into confusion and would create a nervousness which would be a serious detriment to us besides I am very doubtful whether 20 seconds would be sufficient time to effect such a change. It strikes me the much better plan would be to run both machines at the same time. ~~Do~~ ~~this~~ Yours if you tell me of some objection thereto — I shall certainly try it. I will shortly employ a man for gathering statistics and will then supply you with the information you request.

6

Crystal Palace. — Last night (Jan 18, 1882) I formally opened the Edison Exhibit at the Crystal Palace. I had previously run for an hour or more on Saturday evening and for a couple of hours on Monday evening. Tuesday evening however was to be the public opening and in accordance with previous arrangements I sent out some 150 invitations to the Press, the Honorary Council of the Exhibition, and the Directorate as well as the other Electric Exhibitors. Some 100 accepted and were present. The hour set was seven o'clock. Everything was working satisfactorily and I left the Engines to go up into the Concert Room to receive my guests at 15 minutes to 7 o'clock. Halloway came up immediately after in great consternation to tell me that the safety plug had blown out of the boiler and that they would have to withdraw the fire and the steam and that it would not be possible to start up again during

7

the evening. This was the usual refreshment that I have by this time become accustomed to partake of on such occasions. I was therefore not completely prostrated — went downstairs, interviewed the foreman of Robey & Co and my own Contract Engineer who was present and learned from them that Halloway was quite correct, that the thing could not be done. I went upstairs again — scratched my head 3 times, ordered the gas to be lighted and went back to understand the situation a little better myself. I got the three of them together and said "Now I want to understand this thing". Tell me just what has happened, show it to me, now tell me how to repair it. Now tell me in how brief a time it is possible to blow off steam — draw the fire — insert another ~~block~~ plug and get up steam again? After some little debate it was decided that it might be done in an hour and a half

I said "that settles it; in one hour time I shall expect to have the light. I am now going upstairs to entertain my guests at supper and I am going to explain what has happened and to say that in one hour from now the Engineers will have the matter all right". They then went to work with the determination to do it, the battle was more than half won. We soon after sit down to the collation and after enjoying a good meal the Chairman of the C.P. Company (acting as Chairman of the gathering) rose and remarked that I was desirous of making some announcement upon the light. I then got up and explained the situation. Up to this time nothing had been said although it was pretty generally known that something had happened to the Engine. I explained the matter and then having meantime sent a messenger to the Engine Room to ascertain the fact, announced that in just 15 minutes

from the time I was speaking the light would again be ready. This announcement was received with considerable applause. I then informed the Company that the Chairman in consideration for my feelings had waived one of their most stringent rules. viz: - "Prohibition of Smoking" and that I had the pleasure of informing them that they might smoke, and in order to supply them with the weeds I had ordered them as well as Coffee. Before the smoking had fairly got under weigh & within a minute of the 15 minutes promised I saw Hammer pushing along the Gallery for the Switch box, from which the circuits are controlled and saw him quickly turn a switch which gave a momentary flash of light in one of the lamp circuits. This was the signal to me that everything was all right. I then called out for the gas to be turned out. Hammer instantly flashed the light throughout the building which was received of course with great applause.

10/ There were 300 gas jets as against 213 A lamps. The gas jets were full size but the illumination effected by the lamps was fully if not more than 3 times that effected by the gas. This was due partly to a fact that the Engineers were allowing the Engine to run away with it and brought the lamps to 20 or 25 Candles. I tried to catch Hammers Eye & Signalled to him to throw on some more lights which were at hand outside the temporary screen of the room proper & underneath the galleries, but failing in this I simply called out to him to do so, remarking that the Electro motive force was too high. This served to explain why 3 or 4 lamps had collapsed. After he had done this no further breakages took place. The speechifying of the evening then began and some very Complimentary things were said of the System, of yourself, as well as of your humble servant. The Duke in a speech of some 10 or 12

minutes length in which he managed to keep the interest of everybody in rather an unexpected degree, paid me some extraordinarily fulsome Compliments. I presume it is unnecessary for me to express an opinion as to his object in this, but as I am sending you the papers giving full accounts of the affair I will not go further into detail. Suffice it to say that as usual in such cases the contretemps was rather fortunate than otherwise. It gave me an opportunity to explain which I did thoroughly the object in having 3 engines instead of one and to say that so soon as my other two engines were ready with their plant I proposed to amuse myself by blowing out fusible plugs or in some other way temporarily stopping an engine in order to shew that I might do so without effecting such an absence of light as they unfortunately had witnessed the earlier part of the evening. I do not think that the object of these three engines

as well as your principle of subdivision of power in order to secure reliability could have by any possible means been impressed upon the minds of all present to any such extent as it was but for this unfortunate stoppage. We are now running every night. Halloway has charge of the dynamos and Robeys own man charge of the Engine and one of Hammers assistants charge of the lamps & circuits. My friction cones gave me a little trouble in the early part of the evening but they soon settled down to solid work and I am satisfied that they will not slip even though I put 75 lights on each dynamo that is to say they are capable of transmitting 20 horse power without slipping. I did not go out to the C P this afternoon nor did Hammer but we have since heard that everything went off smoothly and the lights were entirely satisfactory in every way. We both had on hand more important work this evening which will appear below.

Contract. Since my last letter I have written the paper on the "economy of the Electric Light" which Mr Waterhouse asked of me for the purpose of presenting to Mr Barnerie and his friends, and in order to cap the climax to any effect it might have I requested Mr Waterhouse to invite all those who contemplated joining him to come to headquarters at 5 o'clock this evening and I would run the big machine and put 300 or 400 lamps on it in the building and thus give them to understand in a practical way what it was they were buying. They came in force (some 25 or 30) Sir Jno Lubbock being the only notable absentee; he was unavoidably called elsewhere. I had Preece, Bidwell, and a few others along to verify my science. As usual we were a little late getting started and after waiting patiently for some minutes after the appointed time when Hammer promised me the light I went downstairs to see what was wrong and on discovering that the machine would give no current

I suggested that possibly the switch which he had placed in the field for the purpose of safety might not be making contact especially as it was the new 100 light switch which Bergmann had just sent us and was provided with the safety catch. He said it could not be in that - that that was all right. I however out of mere curiosity took a wire and short circuited it when the lights throughout the entire building immediately came up. Subsequent investigation showed that the switch had been sent us with the place for a safety catch but with no safety catch therein. We put 460 A lamps in our building decorating the great shaft with them in a spiral form like a may pole and I put 100 on naked wires stretched on the wall on a system of conductors illustrating of your district supply principle with feeders &c. Everything went off entirely satisfactory and we ran for a couple of hours to the delight and

astonishment of every one present. Of course we had ~~above~~ a "bug" and that was in one of the protector blocks in which the brass ring heated and gave way with a flash of trumpets not at all soothing to the nervous. I explained this away however without much difficulty and Mr Bouverie took the matter up and said that that was a capital illustration of the Edison Safety Catch principle. I then confirmed him by showing that all current had been absolutely withdrawn from the particular circuit which that had supplied and the wires might be mixed up interminably without further damage and at the same time the lights on other circuits were not in the least interfered with. Around the shaft we had 154 A lamps and a switch in circuit. I threw these 154 lamps on and off repeatedly without the assemblage being able to detect any variation in the other lights. This was commented upon very favourably as was also every part of the demonstration which

I made to shew the absolute individuality of both lamps and branch circuits. Mr Bourne before leaving remarked to me as follows "Mr Johnson, I received your argument on the economy of the light and I want to compliment you upon it; it is an exceedingly powerful statement and will doubtless go far to satisfy us, and what you have shewn us tonight will no doubt remove all question as to Mr Edison's ability to do what he claims." The bearing of this is important. I shall see Waterhouse tomorrow and try and ascertain from him whether or no they will not now be able to conclude (as I suspect they have already) that Clause 17 may be waived. The expenditure for the supper and the demonstration at the Palace last night is more than balanced by the éclat which the morning papers gave us and which was of course all fresh in the minds of my guests at this afternoon. Their minds were affected not only what

they saw tonight but by what I did last night in a wholly different place and under wholly different conditions. The one was a demonstration of the capacity of your central station plant & the complete and practical character of all your work, and the other was a demonstration of what might be done with the small isolated plants. This was commented upon by Mr Bouverie who seemed exceedingly desirous of assisting me to make a favorable impression upon his friends. I have not the slightest doubt but that they all went away satisfied with their proposed purchase. Post Office. Preece informs me that all the other Electric Light Companies have had a trial in his main Operating room, Lane-Fox being the last, but that they have all failed and Fawcett who takes great interest in the Electric Light although he cannot see himself is desirous of giving us a chance to shew what we can do. I told Preece I would

give him 50 lights in the Post Office from my Central Station if he would find a way of getting a couple of conductors from the end of the subway to the P.O. building. (Snell will explain how far this is). He agreed to do this and I am therefore preparing to light up one section of the Post Office. Instead of doing it by chandeliers, as all the other fools have done I propose to put one of your lamps in the centre of each quartette table with one of your shades on it & thus light all the tables in that wing of the building. I told Preece I was an operator myself and knew what I should want if I were going to use the lights and I proposed to put lights in accordingly. He said "that is just what I want, if you put the lights in as you suggest they will be a success and if you can supply the light from your Viaduct Station, it will be a very great card." I quite agree with him and want to see this fact. As the wires

have to run overhead from a building which is just at the end of the subway to the Post Office I want to make them as small as possible. I have therefore calculated for a loss of 10% and shall put in the Post Office some 101 and 2 volt lamps which I will get from Batchelor. I have been telling everybody that I am confined to the Viaduct by the existence of a law which will not permit me to open the streets and that I will not run wires overhead because it is adverse to our ideas of how electric light should be done but I have said to Preece that inasmuch as this is a Government matter and as he takes all responsibility for the overhead running I will waive my rule in his case and give him the light; that is to say - I will deliver the electricity at the end of the subway and he himself carries it to the Post Office. I can come out of the subway in the cellar of the Public House on the corner (which Inault will know as he was in times past

a frequent visitor.) and go up through the building to the roof, the proprietor gladly giving me permission for the sake of a few lights which I will drop him on the way. From the roof of the this building to the Post Office no street is crossed except a narrow one right at the P.O building, so that the wires will be unobtrusive and unobjectionable. Fawcett is giving a lecture or talk of same kind up in North London about the end of this month and has asked Preece to ask me if I will illuminate it. I have agreed to do so in view of the importance of securing his (Fawcett's) good will and will take my Society of Arts plant there for the purpose.

Covent Garden. Tell Mr Fabbri that two gentlemen from the Covent Garden Theatre called on me this afternoon presenting themselves in his name and wishing to know if I was ready to undertake the lighting of their Theatre. I consider

that we can so much better light a Theatre than Swan has done the Savoy that I hesitated some time before declining & they agreed that I would meet them on Monday make a survey of the premises and see whether or no the proper facilities could be obtained for power &c, and if so would undertake the work at once. If I go into this it will be with the express view of totally eclipsing the Swan experiment; that is so miserably done however that I will have no difficulty in the matter. More of this after I have had the interview.

Moses. This gentleman is here (I do not mean he who smote the rock but rather he who has been smitten by the rocks.) I have only seen him a short time; he dropped in unexpectedly on my circus last evening at the Palace and as you will see by one of the Papers managed to ingratiate himself with one of the newspaper men; he was the guest of Col Gourean and is to day. I understand

he is on his way to Italy for recreation and so forth. I further understand that he has with him that famous arc lamp that he wanted Mr Lowry to buy for you. Gouveau is also infused with it and I think together they propose to do some business. However of this I am not sure. He intimated to me that he proposed to remain on this side of the water for a few months. I am rather of the opinion that he would like to be appointed — Manager of the Crystal Palace Exhibition but I think we can take care of that without any such an experienced — assistant.

Bidwell. This gentleman has become so far converted from the quasi — antagonistic position he occupied toward you as an English Juror at the Paris Exhibition by his investigation of your patents that he has actually signified to Mr Waterhouse his desire to take a share in the New Company — comment would be superfluous. You object to the use of the word obvious but I think it may be used here without criticism.

Faure Battery. Redivivus. This affair seems to have gathered new strength from the late sojourn of its managers in Paris. They have again appeared on the scene in full force and accompanied by Faure himself. I have had 2 or 3 interviews with him during the past day or two and they give evidence of having come into possession of some money. They say that their organisation is about perfected and they will be afloat in a few days. Meantime they asked me to have you send over 20 lamps of 5 Volts, 20 of 10, and 20 of 15 or thereabouts. They say that if you can do what you expect in this matter an enormous business can be done and I am not altogether sure but what they are right. I have therefore cabled you to forward the lamps at once. I have a letter from them ordering — definitely now a very large number of these lamps if on trial the few you send prove to be satisfactory. I hope you

will send them promptly and as in all my dealings with these people I have taken the ground that we were ready to supply them with whatever they required always providing that our dealings would be upon a legitimate business foundation.

Sockets. I think I did express my opinion on the improvement in the socket but if I have omitted it, I now say that I consider it a very decided one; however I shall have further remarks to make on this subject in a few days.

Very truly yours

Edwd. H. Johnson

New Sig for 1882

P.S. I enclose letter from Mr Waterhouse and printed list of Honorary Council of the Electric Exhibition

[ENCLOSURE]

Copy

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. Jany 19th 1882

My dear Mr Waterhouse

I am in receipt of Mr Bouverie's memorandum. As I have as you well know, not had a moment of time in which to collect data to show Mr Bouverie that his figures are erroneous, I am compelled to simply point out a few things which I think he will himself admit and which will considerably alter his deductions.

"First: He assumes that a common gas burner burns 2½ to 3 feet of gas per hour. Now in point of fact you will find by the little Book transmitted herewith that the average London burner burns certainly not less than 5 feet of gas per hour.

[ENCLOSURE]

2

Second. The amount of light obtained from the consumption of these 5 feet of gas is as this shown by this little Book, not above 7 or 8 candles or about 1/2 the candle power of one of our lights. We have therefore, if the figures given by this Gas Engineer are correct, the following as a basis for comparison. 10 feet of gas for every 16 candles of light actually obtained

Third. The Edison lamps actually yield 16 candles of light each.

Taking Mr Bowmie's own figures as the price of gas, namely, 4s per 1000 we have the following: 10 feet of gas per 16 candles of light obtained. Thus 100 feet of gas is the equivalent of 10 of Edison's Lamps in light giving power. 100 feet of gas at 4s. per 1000 is 4 2/10. One H.P. is obtained by the expenditure of 3 lbs of

[ENCLOSURE]

3/

coal. The coal used for generating steam power in our economical boiler is of the very cheapest kind. In New York it averages half the price of domestic coal. Assuming that the same difference exists in this country, as the domestic coal advertised at from 20/- to 24/- per ton steam coal will cost from 10/- to 12/- say 11/- per ton. We therefore have one horse power (say 3 lbs of coal) costing $\frac{3}{2000}$ of 11/- equal to one farthing. You will thus see that Mr. Bouverie's assumption that a horse power costs considerably more than 1/4 is an error. In point of fact a horse power is obtained with our appliances, boilers and Engine at an expenditure of 2/4 lbs of coal but to be liberal I have called it 3 lbs. As I have shown these 3 lbs cost but one farthing and not a sum in excess of 1/4 as Mr Bouverie supposes. We have therefore the difference of cost

[ENCLOSURE]

4/ as between gas and Electricity. (Taking the figures of a well known Gas Engineer as a basis) the following: 160 Candles of Light by gas costs 4 8/10 or nearly 5d while the cost to produce the same amount of light by the Edison process is One farthing which is but 1/20th of the selling price of gaslight. I would not of myself take such an illiberal view of the light product of a 5 ft gas burner but I think I am thoroughly justified in taking the findings of a Gas Engineer of authority whose work from which I quote is well known and recognised as accurate and in every way reliable.

I trust upon my return from Scotland to be able to meet any criticism Mr Bouverie may have to make upon the above figures

Very truly Yours

(signed) Edwd H. Johnson

Manager.

[ENCLOSURE]

Copy

Memorandum by Mr Bouverie.

19th Jan. 1882.

The commercial problem to be solved, now that the scientific difficulties of domestic lighting by electricity are overcome, is to produce such lighting at a cost not exceeding that of gas to the consumer. It appears to me that the solution of the problem is not arrived at. A common burner of gas consumes I believe 2½ ft of gas per hour, say 3 feet, ten lights therefore would consume 30 ft per hour. The cost of this to the consumer is at the rate of from 3/. to 5/. per 1000 ft. I pay now 3/.° but say 4/.° = $\frac{30}{1000}$ of 4/. = .03 of 4/.° = 1.°¼ $\frac{36}{100}$

Now I understand that the Edison lamp requires 1/10 of 1 H.P. to light it. Ten lamps = 1 H.P. The coal consumed to work 1 Horse Power per hour must greatly exceed 1¼ without any allowance for interest on plant, depreciation &c.

New York January 23 1882.

Received from E. P. Fabbri. Ten thousand dollars as a call loan, which sum may be taken from any monies coming to me through Drexel Morgan & Co. after this date

$10 000.00

Thomas A Edison

PAID

Copy

New York 27th April 1882

Received of Drexel Morgan & Co Thirty five thousand dollars on account of my share of the advance royalties coming from sale of English Electric Light Interests

$[redacted]

Thos A Edison
By Jacob Lovell Atty

Drexel Morgan & Co

jan 24. $10.000
7 155
28
31 10.155
27 24845
93
$35.000

Rec'd cable 18th Feb 82

6, Lombard Street, E.C.

London January 28 1882

T. A. Edison Esq.

65 Fifth Avenue, New York

My dear Edison,

I am afraid your tariff of prices, as regards Dynamos, at least, will have to undergo a serious revision as I find it quite impossible to compete with manufacturers here without incurring a considerable loss on the prices paid you on those I have. I will send you next mail a full analysis of comparative prices. Of course it may be that yours save more than the difference in results but this I am not in a position to assert nor could I trade on it until it has been proved by experience & on some high authority. Until this is done I see no way of using the dynamos that I have, unless I can use them here in carrying out some orders which the Domestic Electric Lighting Company have for lighting large buildings &c. Of course as regards our interest in England the more of your isolated plants we can get spread about before issuing the Company the better, and as those contracts

(1)

(2)

6, Lombard Street, E.C.

London 18

made by the Domestic Electric Lighting Company have to be carried out by some one's dynamos I have taken such steps as that they will take those that I have if there is no objection to their being used here. I have no doubt Johnson will approve as he cannot fail to see how by advertising ~~this~~ your system it will be assisting him in his work at Holborn Viaduct, but I have not been able yet to talk with him fully on the subject. The Domestic Company, which has been worked up by a man who, I find is a very old friend of mine, has a large number of orders for theatres hotels & one or two parishes, the result of months of negociations. These if you and Johnson approve they are desirous of carrying out with your system. I have also been invited to join the Company & most probably will be offered the chairmanship. I shall be glad to hear from you soon as to this & if you approve of my selling them the dynamos I have please cable me "Vendor".

Yours very truly

F. Fournaud y.f.

Answered by 18th Feby
Cable Co 18th Feby
Edison Lopes
Letter

6, Lombard Street, E.C.
London January 28th 1882

Thos Edison Esqre
65 Fifth Avenue, New York

My dear Edison,

The Solaire Arc Lamp. I presume you have heard of this through Batchelor & Moses - It is a sort of semi-incandescent lamp with carbons overlapping each other and impinging against small blocks of high resisting substance - During the Exhibition and well on towards its close this lamp seemed to attract a great deal of interest and was brought to my notice by Moses - At the time I was under the impression that it was being secured on behalf of the Paris syndicate that bought your system - I do not know whether this is so, but it appears that Moses is able to secure this on what seems to be very moderate terms, if it is as good as Moses and others appear to think - Now as all the arc Companies are working incandescent lamps of some sort - generally poor imitations of yours, which are doubtless infringements - it seems to me that the development of your system will involve to some extent, the desirability

Edison ^

6, Lombard Street, E.C.
London 18

of an arc light to work in conjunction with your incandescent system where an arc system might be required - Of course I cannot say that this will be so, but if such is the case, (and everybody seems to think so), and if this Solaire light is really what I am told, it seems that the option that Moses can secure ought to be taken advantage of - I have spoken to Johnson in a general way about this, and told him that if you approve, and he (Johnson) will join me together with your goodself, we will form a Company to buy this light, none of the directors of which shall be connected with your incandescent system, but such that we shall be able to control, and as in the development of our system people require an arc light we shall recommend the Solaire, and the Solaire Company in their turn shall recommend ours whenever they may be able to introduce an incandescent system, which I presume will often be the case - Now if you approve of this please cable me "Solidify" - If you do not approve say "Liquify" and I shall be satisfied without asking any reason -

Yours very truly
G. Gouraud Jr.

See also "Electric Light — Patents" 1882

Answered Feb 4 1882

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON, MANAGER.

57, Holborn Viaduct.

London, E.C. January 29th 1882

Thomas A. Edison Esqre
New York.

My dear Edison,

I have your various letters by the "Servia" and am very much obliged. You will have discovered long since that Bidwell pointed out to me the difference between an ampere and a unit of energy and that my error was confined simply to the misuse of a technical term and did not consist of an error as to facts. You will also have learned by my further papers that I corrected the mistake as to the sum of the resistance of 100 one ohm lamps in multiple arc. That of course was a mere slip due to hasty calculations. For the other corrections you make in respect to the laws of heat by convection please accept my thanks. You are quite correct in saying that I have made some progress toward a better understanding of the physical laws governing this branch of your system since I left America. In fact I am continuing that progress all the time. I have no assistance and have to thrash

it out for myself. My time was so entirely occupied that I found it impossible to go on with the Report and finish it in time to be of any practical use to Bidwell and further I find that I was compelled to study the thing out myself before I should attempt to inform others. I therefore chose another path, namely, that of criticising Bidwell's own deductions and findings verbally. I have had frequent interviews with him and have had him at 57 to see the operation of the big machine and to learn the ~~foundations~~ functions of its various parts and in an argumentative way disputing the ground step by step I have been able to make him comprehend the thing as I did not myself comprehend it at first. I think when I get through with this work I will know enough about the entire system to enable me if occasion should require to write something of value. I enclose a copy of a Letter which I ~~trust~~ addressed to Mr Bouverie a week ago today. I also enclose copy of his reply thereto. I have been in Scotland all the past week attending the Telephone Trial and have consequently not been able to see either Mr Waterhouse or Mr. Bouverie. I am in receipt of a Cable from Mr. Fabbri in which I am asked to inform Mr.

3.

Waterhouse that parties in New York think it is time his friends shaned reply. I will not now go into this matter further than to say that tomorrow (Monday) will be devoted to interviews with Mess Waterhouse and Bouverie which will doubtless result in a cable and therefore this letter will be anticipated; if not in a cable I will give the result of the interview in a second letter which will accompany this. I have seen Sir Wm Thomson - in fact, have been with him all the week. I spent yesterday with him at his laboratory and house in Glasgow and assisted him to make the first attempt at lighting his house with a few cells of Faure battery (which had been previously charged with his sulphate of copper trays) and with the Swan lamps. It is not necessary for me to say anything in regard to the result more than that after I had taken two or three crosses out of his wires it was successfully accomplished. He is very much pre-occupied with this little experiment and has a number of our lamps which he proposes to use in conjunction with Swan's

4/ but at present has not got his Gas Engine to work and consequently has not sufficient electro-motive force to operate ~~them~~ — not even the B lamps. He tells me that Swan is now making a lamp which at 20. candles lasts 1000 hours and that he obtains of these 10 per electrical horse power. He says that you are behind Swan in this respect. He says that he acts in an advisory capacity with Swan but not exclusively — that it is especially stipulated that he shall be absolutely free to act in a like capacity with others. He says that there can be — absolutely no question but that Swan conscientiously believes that he has a right to make these incandescent lamps and that he independently of you worked out the several features embodied in his lamp. I told him that I would accept his (Thomsons) assurance of this as honestly given but at the same time I must assert my disbelief in Swans absolute honesty and express my belief that he (Thomson) was in this matter grievously mistaken — that to me it seemed absolutely impossible that Swan should be ignorant

5 of the fact that you were the inventor of the process of occluding ~~of~~ the gases. He seemed much interested in what I had to say on this subject and asked me who had the prior patent for this process and for other features. I told him that your patent ante dated Swan's by several months and that your process was fully and freely discussed in the scientific papers and I told him that an examination of your lamp patent had been had by competent experts and in their opinion was a valid one. He asked me if we proposed to move against Swan. I told him that we did not propose at present to move against anybody that all they were doing was simply helping us and that so long as they confined themselves to the petty isolated lighting which they were now doing they could not in any sense be considered in competition with us — that our scheme was a much larger, broader and more comprehensive one and I told him further

that at all events if we brought suit — against anybody it was not at all likely that in the first instance it would be against Swan, but that we were certainly determined sooner or later to establish our right to the incandescent lamp. He seemed to regret that such a state of facts should exist and asserted that he had not seen any of the Patents and knew nothing whatever about them except as he was informed; that he did not propose to lend his assistance either to Swan or to us as against Swan in the matter of asserting our several rights under these Patents; that his present feeling was from a long intimacy with Swan that he (Swan) was a man who would not designedly appropriate another's invention; that if he had done so in any degree he felt sure that it must be an unconscious one; he quite understood that where two inventors were working in the same direction for so long a time as he — personally knows Swan to have been working, that one might gather from the atmosphere as it were the influence

of another's work and be unconsciously governed thereby, or words to that effect. I sought strenuously to urge the old gentleman to co-operate with us but while I did not obtain a flat refusal he did give me several reasons why he thought he ought to hold himself entirely independent of any Electric Light Company. I found upon further conversation running through several hours that his main object in taking this course is the fact that he himself is bringing out a Dynamo Machine. He says he has been at work upon it for fourteen years; he admits that he is very slow and that it is not nearly ready to come out yet. I told him that in my judgement his Co-operation with us would not by any means prevent him from continuing his work & perfecting his machine, and that further in my judgment he would find that the best possible market for his machine when perfected, would be the Edison Company, as that Company would be early constituted & would be the strongest & best equipped

8 Electric Light Company in the world, & composed of gentlemen with whom even her (Thomson) might find it an honour to be associated. He seemed to be somewhat impressed by what I said & consented to my proposition that he should very early visit me in London and learn more of the paraphernalia by which you have perfected a system. He then agreed that at all events he would do some special work for me. I therefore made an arrangement with him by which he is to measure your A Dynamo and to give me a professional report thereon determining the proportion of light produced to power applied, the various resistances &c &c. He also agreed that he would hold himself subject to my wishes in respect to cooperating with Sir Fred.k Bramwell and myself in the matter of a Report upon the Cost question as per Waterhouse's memo. I may say here also that Sir Fred.k Bramwell with whom I have also been much during the past week is quite ready to join Sir William in making this Report. I have had considerable conversation with them both and am satisfied

9 that they will deal with the matter in the largest possible way. They are both of them firm believers in the success of incandescent lighting commercially and are both very great admirers of Yours. They cheerfully assent to my proposition that you are the only one working on the lines essential to any general system of distribution. They both agree for instance that individuality must be given to the Lamp and that therefore high resistance in a single Lamp is the desideratum. They both agree that this has nothing to do with the economy of the Lamp per se. They both agree that extreme low resistance is essential in a Dynamo. They both agree that the only way to sell Electric Light is by meter measurement; they both agree that the life of a Lamp should be fixed slightly above the mean of its cost and the cost of the current which supplies it. They both consent to the proposition that their Report will have to deal in the most liberal manner with the scientific question of practical details in respect to the point as to what may be expected in the immediate future rather than as to what exists to-day, and that the value of their Report would consist rather in the expression

10 of their opinion as to what will early be done than as to what is already done. I have formed an exceedingly favorable opinion of Bramwell. I think of the two men he will be the least biased. His knowledge of physical laws is very wide and very thorough and his belief in the future of Electrical progress is very decided. He has an analytical mind of the first order. The manner in which he has handled the Telephone contest as seen by us who were behind the scenes rather than as shown by his public utterances at the trial is something superb. Had he been on the opposite side to us there is a strong probability that both your Patent and Bell's would have been declared invalid by the Court. We through his aid found many weak spots some of which would have been fatal but which the other side failed utterly to discover. The battle was fought and I think won although the Judge will not decide for some days; but I must go back to Electric Lighting. Thomson is no longer interested in any particular in the Faure Battery. He admitted to me that his association with these people was not satisfactory. Knowing what I did of his feelings in this respect I did not press

11 him to any direct assertions but I implies from his conversation that he looks upon his whole connection with this affair as unfortunate. I am on the whole somewhat disappointed in not being able to secure his full cooperation with us but I feel rather pleased to be able to inform you that I have made definite arrangements with him to act for me in the two special directions above cited. This I look upon as an Entering wedge and I feel sure that it will lead ultimately to a more full alliance. It is very important that we should secure him for let them say what they will there is no authority in England at all comparable with him in the Estimation of the public. I shall consult Waterhouse tomorrow as to the advisability of immediately handing a Retainer to Sir Frederick Bramwell to secure his services in any future Patent Contests. I have already retained Dr. Hopkinson and I feel quite sure that united, these two men could induce Sir Wm Thomson to act with them when the crisis comes. You will see by the full reports which I shall send you of this Telephone contest that our Witnesses namely Sir Fredk Bramwell, Sir Wm Thomson, Dr. John Hopkinson, Mr. Jamie (Siemens' Patent Attorney) and myself supporting in our various ways your position

13 in the Carbon Microphone affair; ~~therefore~~ I do not think you will have any cause to complain of the thoroughness with which they committed themselves to the fact that the microphone is nothing more or less than your Carbon Transmitter. The other side of the case was supported by Conrad Cooke and by Prof: Blythe. These two witnesses were so absolutely confounded on cross examination as to constitute their evidence of more value to us than to their own side: They were the only Witnesses produced and to sum up the whole week's contest in a few words I may say that all were perfectly astounded that the great controversy of 4 years standing should have been supported at the critical juncture by such an excessively weak array of talent.— Conrad Cooke is so badly used up in the opinion of all concerned that it will be a long time ere he gets another case. There can scarcely be a doubt that the case will be decided in our favor. I had to leave before the final address of their Counsel was given but all agreed that his witnesses had so completely failed him that he could make but a very poor argument. They were in doubt for 3 days whether to put me in the Witness Box or not. They were afraid that I

13 Knew too much and that certain questions would be asked me in respect to the Phonograph and other things the answers to which would be very damaging to us, more so than any direct testimony would be of good but it became very important to prove that Telephones, such as described in your 1877 Patent had actually been made and used and further that the Phonograph was in reality an instrument which would both record and transmit telephonic messages. I was therefore put upon the stand to prove this which I did. The cross-examination was very brief and feeble amounting to nothing. United Telephone shares have taken a sudden rise by virtue of a rumour which is now quite current that the Government is about to buy up the Telephone. I send you a copy of a leading article which lately appeared in the Times. You will see that that paper takes a very proper view of the whole situation. You will observe in the Electrical Review of Jany 28 (page 51) which I also send, a paragraph about one third the way down the right hand column reading as follows: "We are not "surprised to hear very severe comments and "harsh accusations made against those officials "whose duty it probably has been to advise with

14 "Mr Fawcett in this matter but as the honor
"of these gentlemen is so well known they
"can probably afford to pass by any such
"unfavorable comments in silence.
"It is however to be hoped that no recently
"begotten friendships have had weight
"perhaps all unconsciously in influencing
"those whose advice the Postmaster General
"would most likely consult before he
"arrived at the decision above cited".
This is a slap at Preece for his alliance with
you on the light. I have not seen him since this
came out but shall in a day or two. I trust
that you have long since sent me the letter
which you said in one of yours you intended
to write to Preece. I am very sorry it has not
arrived as long a time elapsing will ~~destroy~~ rob it
of its spontaneity. But better late than never,
so send it on immediately. It will be useless
of course for me to say anything here about
the shipment of the big machine as you will
have shipped it before you receive this. I am
to light up on February 1st (now almost here)
I shall have to send an apology to the City and
if they object make the best of it with my
single machine. I do not know how my present
Engine will act with a big load but I do know

15/3 that with 400 to 500 lamps on it works beautifully.
Crystal Palace Hammer informs me is about
ready to light up with the second gang. The
Entertainment Court (our head quarters) is
going to be the finest Exhibition by many
times the Entire Exhibit will afford. There is to
be quite a gathering there on Tuesday next
and the Crystal Palace Company propose to
make of the occasion the formal opening
of the Exhibition. I propose to go down there
tomorrow and start up as much as possible
so as to have our Exhibit well nigh complete
on Tuesday. I asked you in a Telegram how
many A Dynamos you had shipped me
altogether. You reply that you shipped 4 on
the 11th and 6 on the 13th. That is not the
question I asked. I want to ~~ask~~ know how many
A Dynamos you have shipped to England for
me. I was under the impression that you
sent 3 with the big machine and that my
subsequent order for 10 A Dynamos and 10
B Dynamos was filled. That would give me,
(assuming that the 3 which originally came
with the big machine were all A Dynamos)
13. A Dynamos, and 10 which you now notify
me were shipped on the 11th & 13th would make 23.
Hammer tells me there are only 7 A Dynamos
altogether. There is a mistake somewhere. I wish

16 You would advise me definitely exactly what you have shipped. It is just possible that we may have got mixed up with Gouraud's or that you may have construed my original Order for 10 A's and 10 B's to include the B previously shipped. I will have Hammer overhaul Gouraud's consignment and see if any of ours have got mixed up with them though this is not a very easy matter considering the bulk and weight of the packages and the manner in which they are stored. I have not seen Gouraud for over a week and am therefore in the dark as to what has been going on in the matter of Colonial Light & Telephone but I hear from him indirectly that he has done a good thing for me. Just what that good thing is I can only surmise from Fabbri's Cable which reads "Sold through Duke, "Australian Colonies 'Fifty thousand'" I do not know whether that means Australia and the Colonies for "Fifty thousand" or whether it means simply the Australian Colonies for 50.000 £ or 50.000 $. It is too indefinite for me to rely on. Therefore I shall endeavour to obtain the facts from Gouraud without letting him know that I am in ignorance as to the meaning of a Cable I have received.

Very truly Yours,

Elwd. H. Johnson

[ENCLOSURE]

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

Copy

57, Holborn Viaduct,
London, E.C. Jany 23rd 1882

The Rt Hon.
E. P. Bouverie.
Dear Sir.

It has occurred to me that in view of Mr Fabbri's enforced return to America before his negotiation with yourself & Mr Waterhouse was much more than merely inaugurated and in view of the further fact that Mr Waterhouse is thereby compelled to act in the dual capacity as representative of Mr Fabbri on the one hand and himself and associates on the other, that it would not be improper for me to express to you directly the view of the situation that I take as one having a knowledge of the minds of Messrs Edison and Drexel, Morgan & Co. on the one hand and to a certain extent that of Mr Waterhouse and your own on the other, as well as a practical knowledge of the thing itself, which I at times feel wholly unequal to properly conveying to others. My opinion of the propriety of such a course and my consciousness of the responsibility which Mr Fabbri's premature departure has thrown upon me are in such conflict that I will not assume to decide the issue between them myself, therefore if

[ENCLOSURE]

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This paper reaches you at all it will only be with the approval of Mr. Waterhouse to whom I first submit it. I would rather that great sacrifices should be made on our own part than that I personally or as the representative of Messrs Edison and Drexel, Morgan & Co should by an error of judgment be led into doing anything which would in slightest degree seem to trespass upon the prerogatives of Mr. Waterhouse, Nevertheless, I feel impelled as I before remarked, by my isolated position to trench closely upon dangerous ground in the performance of what I consider to be my duty to Mr. Edison and his partners. I shall depend upon Mr. Waterhouse's older head and better judgment to restrain me from committing an overt act and shall accept his decision without questioning his judgment in the matter.

Mr. Edison is undoubtedly the inventor of the incandescent system of lighting by means of which alone the great problem of the subdivision of Electric Light has been solved. The negative evidence of this fact to be found in the emanations from men of science and the Press between the fall of 1878 and the winter of 1880 is overwhelming. 100,000 people saw several hundreds of these Lamps in practical operation at Menlo Park before any other Invention in this or any other country was able to show a single practical lamp. Living in the clear atmosphere of this fact throughout this entire

[ENCLOSURE]

3/

time Mr. Edison and his immediate associates cannot rid themselves of the opinion that Mr. Edison's right to the discovery as well as the profit to be derived therefrom, will ultimately be found to be saved to him by virtue of some one or more of his numerous patents. Their faith in this is the stronger because of the other fact that extraordinary efforts were made by the organization of a Patent Department for the express purpose of more completely protecting this invention than had been any previous one. That this Department was better qualified to deal with its work in respect to the United States than in respect to England is doubtless true but that it has accomplished something in the direction of the better protection of Mr. Edison's rights in England than would otherwise have been afforded, I think must be accepted.

Again, Mr. Edison made a departure from the ordinary procedure of inventors (himself included) in the matter of floating an invention, in that he determined at the very outset not to essay to put the Electric Light into practical operation until every detail connected with its installation on a commercial scale commensurate with the extent of the field it would occupy was fully and ~~practically~~ satisfactorily worked out, that is to say, he determined that this invention ~~should~~ at all events should not be exploited practically at

of the public but rather at the expense of himself and his associates. The effect of this determination was twofold; it operated to keep Mr. Edison in the background for two years thus affording imitators and infringers an opportunity to study his work and duplicate the details thereof, set up a claim therefor and appear before the public as claimants for the invention. Their designs became the more easily executed because of the further fact that Mr. Edison laid down as a cardinal rule for the guidance of himself and associates, the policy of not wasting either time or energy in the pursuit of such infringers until his work was fully accomplished and he was ready to exploit it. Naturally these imitators have taken his passive position as indicative of conscious weakness and they have become the more boastful and aggressive as time has elapsed without Mr. Edison instituting proceedings against them. On the other hand an advantage has accrued to Mr. Edison from this course fully as great and in the direction he anticipated, namely the attainment of a commercial and practical position impossible to any combination of his rivals. It is capable of easy demonstration that the Lamps, the Dynamo machines, and all the various paraphernalia connected with the subject of Electric Lighting by incandescence possible to aggregate from the Laboratories and workshops of the

various other workers in the field could not be made to fill the position now occupied by Mr. Edison's System. For instance their Dynamo-Machines can only be made to manufacture Electricity on a petty scale for individual use; their lamps can only be used at the source of Electrical supply; the lack of fitness as between the Lamps and Dynamos is so great as to absolutely prohibit their application to any system of general distribution and further in the fact that Mr. Edison, in the possession of the largest resources of any Inventor in the World, in the possession of a fertile brain which has not now never did have its equal in the field of science, in the possession of an energy which impels him and his assistants to work from 16 to 18 hours out of the 24 throughout the year, was still occupied for two years in perfecting the means and methods whereby his present system attained its advanced position over others, we have the guarantee that aside from all questions of patents there must inevitably exist a difference of at least two years between the stage he has reached and the attainment of that position by others, and on the principle that a stern chase is a long one and the fact that Mr. Edison's

rate of speed has not been impaired by the past but rather augmented, that he is today making more rapid progress than ever before, that he comprehends the problem as no other can we have the assurance that he will not be overtaken for many years if at all.- In his Dynamo-Machine alone there are practical difficulties of such magnitude as to prohibit even Mr Edison himself from duplicating that machine without re-traversing the almost identical path he has trod, and in the Lamp also it is my firm opinion he is far in advance on the road which leads to the ultimathule and is the only one traversing that road. — Other makers not having before their eyes the proper conception of the goal to be reached are travelling in the wrong paths and must inevitably retrace their steps and start afresh ere they can hope to reach the point of vantage now occupied by Mr Edison. — We have what might be termed positive evidence of the foregoing facts in this that Mr Edison is today absolutely alone in any attempt to establish Electric Lighting on the elaborate and comprehensive scale requisite to the solution of the problem of supplying the people with Electric Light. Others do not even talk of so doing except in the most desultory and vague way and they one and all look askance at Mr Edison's operations; from ridicule they have passed

[ENCLOSURE]

7.

to the stage of quiet observance of his work awaiting the practical result in common with the general public. I think there can be no doubt whatever that the vast majority of thinking men not biased by self-interest, accord to Mr. Edison full credit for having solved this problem by the invention of the incandescent Lamp and by the creation of his wonderful Dynamo-machine, In view of these facts and of the natural sequence thereof, namely, that Mr. Edison's hopes of large returns for his labour in this field, and in ~~the~~ view of the numerous conversations I have myself had with him on the subject of the introduction of the light in England I can not get rid of the impression that he must be keenly disappointed with the outcome of Mr. Fabbri's negotiation and that he has only given his assent to the terms thereof because of the great standing and of the high character of the names presented by Mr. Fabbri. His oft repeated remark to me was "In the exploitation of this invention we want bold, vigorous, pushing men, men who are not to be frightened by the petty sayings and doings of others, men who will not inconsiderately compromise with imitators and men who are not afraid to venture their money and who will take

a sufficient interest in the enterprise to give to it a large measure of their time." — Now as I view it, there are among the names which have been presented to me, many such men (yourself among the number) and I think Mr Fabbri has himself formed a like opinion. Mr Edison on the other hand, I am afraid is tainted with the suspicion that his old Telephone associates have to a certain extent what he terms "the characteristic timidity of capital", the compromise of the Telephone with the Bell Company, the subsequent payment of large sums to infringers of his carbon patent and the abandonment of the Telephone to other hands together with the misrepresentation (as I know it to be but he does not) that has been made by an interested party who shall be nameless, to Mr Edison from time to time as to the individuals with whom he is now making a new alliance, all tend to impress his mind with the idea that he is not securing to his Electric Light work, men possessing the boldness which he considers so essential. My perfect confidence that you will not misinterpret me is the only justification I have for thus giving with such entire frankness, my view as to what must be Mr Edisons mind. — It is in consequence of these facts and the existence of these impressions strong within me that I feel impelled to

[ENCLOSURE]

9.

to speak of them as having a bearing upon the only issue which now remains the removal of which will permit of the final consummation of the contract with Mr. Edison and yourself. The waving of clause 17 would tend to remove the last lingering doubt from Mr. Edison's mind and give him a confidence in the promoters of his English Company which I am sure would result in good out of proportion to the possible evil incurred by the further risk involved in the payment of the additional sum in question. It is not simply a question of the future with Mr. Edison. - His operations are on such an extensive scale in proportion to his income that immediate funds in hand are absolutely essential to the furtherance of his various enterprises; he is even now compelled to face the question of whether it would not be wise for him to abandon his several manufacturing enterprises to others. This I know would be a sore trial to him and if forced to do it he would feel that he had not been properly supported by his associates. And again I think that for the present at least, it is exceedingly important that the manufacture of the Lamps and of the Dynamo-Machines should remain in his personal hands. In the hands of a company these things would not make that progress towards economic manufacture that they would in his own. I know that his preparations for manufacturing

on a large scale in order to reduce the price are such as would not be made by any Board of Directors of a Company. They would not in fact be made by any capitalist who looked more for immediate profit than does Mr. Edison. A year or so hence they may possibly pass into the hands of a manufacturing company without disadvantage but I am satisfied that it is in the interests of all parties concerned to maintain them in the hands of Mr. Edison for the present and the only way by which this can be done is for his associates to provide him with immediate funds. The part that the English Company can play in this particular is the one at present under discussion. In respect to the contingency for this payment, namely, Mr. Edison's ability to show that he can commercially compete with gas in the city of London, I feel that an exaction is imposed which is not demanded by the exigencies of the case. Gas in London is cheaper than in any other part of the Globe. If he can compete successfully with it here then his invention is of far greater value than we are at present inclined to attach to it, if he could demonstrate before its sale that such competition was perfectly easy, the terms of its sale would be altered.

[ENCLOSURE]

6

On the other hand I think that even were no progress to be made in the direction of increased economy and that it was found that the Electric Light could not be produced at from 1½ to 2 times as much as gas there would yet be a demand for it which would be beyond the capacity of any works which could be created; and further there is no question but that as the Electric Light is gradually made to substitute gas the cost of gas must increase and the Electric Light necessarily reduced, but there is absolute certainty that great advance in the direction of the economical manufacture and distribution of the light is now being made and the means and methods whereby it is effected will be available long before the labour of making a large installation in the City of London can be performed and further that these means and methods do not involve any substitution of existing devices; they simply mean improvements in those devices in their present form and that the improved and the unimproved may be worked side by side the only difference being that the output effected by the improved devices will be at a greater economy. There is another point which I do not think has been touched upon as yet by anyone, namely, that this is a Company which is being organised for the purpose of holding Mr. Edison's rights for Great Britain

and Ireland and not for the purpose of making installations. It would not be possible for any Company (however great its capital) to substitute an Electric Plant for the Gas Plant of the Country. There are too many millions of money invested in Gas Plant to be unsuccessfully set aside by any single Edison Light Corporation. Local Corporations in each gas district will necessarily have to be formed for the purpose of supplying the capital to make installations. The question of commercial competition with gas is one that effects more directly these Local Companies, the amount of capital that will have to be provided by the parent Co^y will not in all probability exceed that already provided for. In fact it is more than likely that the first experimental station will be erected by some Company other than the Company now being organized and the funds provided by this Company for this purpose will not be called upon. It is true that it will be requisite for the parent Co to show these Local Co^ys that commercial success is assured but there is scarcely a doubt that that may be done on the

[ENCLOSURE]

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Holborn Viaduct. In so far as the question of earning a profit upon the amount of capital that this Co. is now called upon to provide is concerned, we may absolutely set aside the larger sphere of great central Stations and the question of gas Competition and yet earn great profit from the smaller field of isolated Lighting.

I do not know whether in ~~any~~ this cursory review I have been able to throw any additional light upon the matter but I venture to submit the views herein expressed in the hope that they will assist you in seeing your way to meet Mr Edison's views without exception. I know that the entente cordiale which will thus be established will more than compensate for the additional risk you and your associates undertake

Dear Sir

Very truly yours

(Sd) Edwd H Johnson

[ENCLOSURE]

Copy

Copy Reply

44 Wilton Crescent
S.W.
January 25th 1882

My dear Sir

I have read your memorandum (forwarded by Messrs Waterhouse) on the Edison Light business with much interest as well as the observations written by you on the question of comparative cost with gas. They are both very lucid & able papers; & throw much light on each other. I do not wonder that Mr Edison is disposed to growl at the caution which has been displayed by people on our side as to going in to Mr Fabbri's proposal. Like all creative and poetic minds he sees no difficulties where men of an ordinary understanding require to make their ground good. This is one of the distinctive qualities of genius, their flight is so high & strong that they are apt to forget they may fly too near the sun & have their wings melted. This, I suppose is the true meaning of the fable about Phaeton & explains Mr Edison's own pecuniary straights. Practically one of the troubles as you know, has been the investigation of the Patents. You will remember what troubles and difficulties & delays we had about the Telephone in consequence of the imperfection of the way these Patents had been obtained. Mr Edison is

[ENCLOSURE]

2

his severest climate, did not trouble himself about these, but till they were mastered, or removed it is impossible without risking everything, to go ahead as he wished. You know too, by this time, something of the slower, duller & more methodical way we on this side go about our business compared with yourselves on the other side.

As a practical question, I am disposed not to insist myself on a full compliance with clause 17 as it stands but taking some other evidence instead to show that gas is not cheaper, or little cheaper than Mr Edison's light but then I must think of what others may require who are expected to subscribe & who may be more exacting on this point than myself. I shall no doubt see Mr Waterhouse on this point in a day or two & I do not think time is being wholly lost

I am
Yours Truly
(Sd) E. P. Pouvenie

E. H. Johnson Esq

[ENCLOSURE]

Major Galon

Please return as soon as possible

Insull

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD. H. JOHNSON,
MANAGER.

57, Holborn Viaduct.

London, E.C. Feby 1st 1882

My dear Edison

The Elec Light Patent which you desired me to purchase for England and the United States for the enormous sum of $500 or $1000 was not (as you will see by the Enclosed Letter from Mr Waterhouse) finally taken out so that it is now public property and there is therefore nothing to purchase.

I am in receipt of a long letter to day from Mr Fabbri enclosing correspondence with Coll Gouraud on Colonial Light transactions I have had no time since my return from Scotland to see the Duke until today but when I called I found that he had not come to the City. I understand indirectly however that the matter is practically closed and that the payments only await the preparation of the necessary papers. I am exceedingly obliged to you as well as to Mr. Fabbri for the interest you have given me in this matter. In one place in Mr Fabbri's Letter he speaks of my interest as "the same that I have in the English affair" and in another place he mentions 2/3. I presume that

2 he means to say is that you have given me a 2½ per cent in the thing. However, for whatever it may be please accept my thanks. I will cooperate with the Duke (as I have been all along) and assist him in every way in my power in perfecting his organisations. I was able very materially to do so only a few days ago. He desired me to take out certain Patents in the Cape Colonies and desired also to have some general information on the subject of the Patents which could have been only obtained by him in an original way by the expenditure of a very large sum of money for Expert Examination. I gave him the benefit of the Examination of the Patents that we have had for the English concern and turned over to his Patent Expert the various Reports and findings that we had made and these things materially assisted him in his operations. I had also at an earlier date run the big Dynamo at Holborn Viaduct for his especial benefit and showed to some of his parties the System in its entirety much to their gratification and very likely effecting their conversion to his terms. You can rest assured that in various ways I will do all in my power to earn the interest you have given me. The Cable sent

3.) by Mr Waterhouse to Fabbri yesterday compromising on Clause 17 was sent after full consultation with me. We had just come from an interview with Webster Q.C. in regard to Patent No. 5. and the impression left on our minds was very discouraging. Webster could not see his way clear by any means to giving us an opinion to the effect that the Patent was good. In fact he expressed himself rather to the contrary. I would not, however, accept his conclusions and in fact he did not wish us to do so saying that he was only partially informed on the subject and he desired to have a more complete understanding of it before giving his final opinion. I believe (as you do) that a more full examination will result in a more favorable opinion but the fact remains that the lines are so closely drawn that we cannot hope that our Patents shall by their strength have much effect upon the minds of intending investors. Mr Waterhouse put it very strongly when he said that in view of the uncertain character of the Patents and of the great

4 Contest that was unfortunately before us in asserting our rights under them and in view of the very large sum of money that the Promoters of the Enterprise would be called upon to sink before any return could be expected, that you should waive a certain percentage of the cash amount payable and forego the report of Thomson and Bramwell. I of course replied as best I could to the effect that the original negotiation made by Mr Fabbri with him (Mr. Waterhouse) was upon this particular understanding, namely, that the Patents were weak and that a large sum of money would be necessary for Installation &c &c and that I did not see that to-day the case was altered in the least and that I could not therefore understand why you should be asked to accept a less amount than was originally proposed. To this he replied that you were only asked to accept a less amount in consideration of the fact that they agreed to waive a consideration which to them seemed very important and which Mr Fabbri promised them, namely, that before they paid the entire £25000 the system should be proven

5, to them to be as economical as gas. On the whole therefore I am not at all sure but what we have done quite as well as the case on its merits would render possible with any other set of men. We have got good men and I am satisfied that the thing will be vigorously pushed. No delay will now be had in effecting an organisation and we shall be able to appear before Parliament with a list of names which will give to the Edison Company an eclat not possible to any other. Messrs Waterhouse ~~Bros~~ Brothers have very kindly intimated to me their desire to take one share in the Company for me and carry it for me until such time as I shall find myself able to take it from them. There are 3 brothers in the family and they expressed themselves as so well pleased with my conduct of affairs generally that they think that they owe me something and are disposed to express their obligation in this practical way. I do not see any immediate prospect of my being able to raise the requisite £2500 but have faith that some time I shall, or at least, that the

6 & 7.

Stock will ere long command a handsome premium which will enable me to sell my share (if I so elect) at a margin of profit. They desired that my name should appear as one of the A Shareholders saying that it would have considerable weight in influencing others to embark in the Enterprise and they asked me to write a letter to them requesting a share which I did to-day. I enclose you a copy of the letter; you will gather from the whole proceeding the purport and will I am sure be pleased to know that I am an A Shareholder as well as a B Shareholder. I am awaiting with great anxiety a reply from you to my Cable of Enquiry as to when the big machine would be shipped. All reports which reach me are to the effect that it is a wonderful bit of mechanism but my own inferences as to it are drawn from the fact that it is not shipped. I was to have lighted up the Holborn Viaduct to-day as per my Contract with the City; That I am not able to do so is a drawback which you will appreciate. I should hope therefore that long ere this letter reaches

you you will have shipped the machine.
Crystal Palace is booming. We last night
had another little demonstration the
occasion being the visit of the Lord Mayor
in State to distribute certain gold medals &c
to the successful Exhibitors of Woollens at a
previous Exhibition held at the Palace. The
distribution took place before a very large
audience in the Concert Room which was
of course lighted by the Edison Electric Light
and the Lord Mayor made some very complimentary
allusion to you as an Inventor and the beauty
of your light without referring to any other
Exhibitors. The Chairman of the Crystal Palace
Company acting as Chairman of the meeting called
upon me to come upon the platform and show
his Lordship how the lights might be manipulated.
I had of course expected this and had Hammer
in the gallery near the switch box. I stepped upon
the platform and gave the requisite signals to
have the lights turned on and off and elicited the
usual applause. I then invited the Entire
assembly to visit the Entertainment Court
(our head quarters) which had not up to this
time been lighted but which we had hurriedly
prepared for the reception of his Lordship. Our
big Chandelier with 99 A Lamps and something

To like 35 or 40,000 pieces of brass was a complete success and the various other fixtures supplied by Verity & Sons were fixed upon the walls around the room and illuminated up in a magnificent manner. The entire party were exceedingly enthusiastic over not only the beauty of the light, but the excellently good taste displayed in every particular. This is only the beginning of the end in this respect. The Lord mayor's party then retiring I admitted the public and for the next hour or so there was a grand rush and much admiration expressed at the display. Altogether we had 500 Lamps in operation during the evening and everything went off entirely satisfactory, no hitches or mishaps to speak of. There were a few Lamps arc? attracting attention to the harmlessness of the performance, generally exciting quite as much admiration as did other features of the demonstration. The Dynamos worked splendidly but thus far I have not put over 55 Lamps on. When I get entirely under way I shall have about 65 Lamps to each machine. I think, however, from their performances thus far that they will stand the strain without the slightest difficulty. The Lamps gave me some trouble. I do not believe they are anything like as good as the Lamps I have

10 had to deal with at home; there it was a very uncommon occurrence that a lamp should arc; here it is the rule rather than the exception – in fact I have seen no lamp expire in any other way as yet; the trouble seems to be arcing simply. In view of this fact and of the suggestion contained in your letter, I today cabled you for 2000 Lamps with 2000 new Sockets. I want these to be able to make a time test in one of my Departments at Crystal Palace or at Holborn Viaduct by the time I shall be completely ready to operate. In regard to Lamps you are under a misapprehension. You say that my Lamps run from I think 106 to 108 Volts. Now in point of fact they run from 105 to 110 Volts. You have made a very grave mistake in my judgment in sending the worst Lamps produced to England. The best Lamps went to Paris and the next best are retained in New York. In England where you are brought in competition with half a dozen makers of Lamps who are striving their utmost to outdo you in Economy in lighting and

in every detail of lamp, you put in my hands to compete with them the very poorest material you produce. I of course am not going to be behind hand in this respect and so shall expect that you will explain to Mr Fabbri and have my order for 2000 good lamps promptly filled.

Telephone: The Judge today gave his decision in the Telephone trial. It was as we all expected to the effect that both the Edison and the Bell Patents were valid and that the Edison transmitter and the microphone were one and the same thing. I send you the text of the decision. I understand as a matter of course that other parties who ~~were more~~ are more largely interested in sustaining the Microphone as against Your Patent than were the small fry with whom we had to deal in Scotland say that they had nothing to do with this Scotch trial and that they propose to test the question by a more formidable fight but I am of the opinion that the precedent we have obtained in this trial will largely influence any future

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friends and that the fact that we were able to get such men as Sir Wm Thomson and Sir Fred K Bramwell. Prof. Fleming Jenkin & Dr. John Hopkinson to attest the correctness of your scientific position will very largely deter any of the small fry from attempting to refute their opinion

Very truly Yours,

Edw H. Johnson

[ENCLOSURE]

WATERHOUSE & WINTERBOTHAM,
Solicitors.

1, NEW COURT,
CAREY STREET,
LINCOLNS INN, W.C.

English Sight
Waterhouse & Winterbotham
Jan. 31. 82

Jan. 31. 1882

My dear Sir,

Archight Patent.

I enclose herewith Blue Book of Patent 4412 1877.

My clerk was informed at the Patent Office that the Patent had "expired". I presume the £50 was

[ENCLOSURE]

not paid when the 3 years were up, & that the Patent is now open.

Edison Company.

I have seen Mr. Bourne & informed him of the cable message despatched to Mr. Robert. Sir John Lubbock is not in town till tomorrow, when I hope to see him. I shall be glad of your letter before I go in.

Yrs very faithfully
Alfred Waterhouse.

E. H. Johnson Esq.,
59 Holborn Viaduct
E.C.

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct,
London, E.C. Feby 10th 1882

My dr Edison,

Enclosed you will find Mr Bidwells report on the Double sealing Patent - You see he is disposed to do the best he can with it - I am of the opinion that Swan can use Crookes method - & that that method is quite sufficient to effect a practical result - for if the tube be sealed at a - while on the Pump - then broken off will not the second sealing at "b" be under conditions somewhat - or at least sufficiently similar - to what you obtain when you make your final sealing - That is to say - Will not there be sufficient influx of air at a - to effect a complete

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THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct,
London, E.C. 188

stoppage of the microscopic hole in "b"? - a few experiments made by yourself or after would determine this point definitely. If not = then Crookes vacuum - which undoubtedly have been maintained for a very long time - have been so maintained because of the accidental formation of your final sealing - in the process of "rounding off the sharp edges left by breaking the glass off at "b" =

Throw some light on this subject & on the other portions of this report -

Yours truly (Saturday 3 P.M. just got the report)

Edwd H. Johnson

English Light
Feby 11. 82

From WATERHOUSE & WINTERBOTHAM,
Solicitors:

1, NEW COURT,
CAREY STREET,
LINCOLNS INN, W.C.

Waterhouse

11th Feb: 1882.

My dear Sir,

Edisons Electric Light

I send you herewith Copy on thin paper for Mr Edison's perusal of Mr Shelford Bidwell's further Report on Patent No 8. (578. 1880) dealing chiefly with the double reeling. We shall be glad to have Mr Edison's observations on this Report and also any observations he may wish to place before us on Mr Bidwell's previous Reports at his earliest possible convenience, as we ought I think to lose no time when once the Company is registered in deciding what we shall do or not do with reference to disclaimers. I know of course how very much pressed he must be with a thousand things but you must endeavour to impress upon him the importance to his interests here of his personal assistance on these very vital matters.

It has occurred to me that you would perhaps like to sound ~~Edwards~~ Hayward Tyler & Co with reference to their taking a share in the Company.

I am

Yours very faithfully

Theodore Waterhouse
for W.&W.

Wm. Johnson Esq
57 Holborn Viaduct.

Dick
You see the necessity for getting up that another Prospectus
Eb.

Cable

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. 13th Feby. 1882

T. A. Edison Esqre
New York.

My dear Edison,

I have 8 machines in operation at the Crystal Palace. Two of them (One particularly) get quite warm with the load they are now carrying, namely 64 lamps each, the others remain perfectly cool. I presume these two are of the 5 that were first shipped with my big dynamo, and that they are not the same as those subsequently shipped. I am going to take them out and put two others in their place out of those you have just sent me. I want this plant to run 70 lamps each for 5 hours every night. I know that 6 of the 8 machines will do it without the slightest difficulty and I want to get 12 equally as good. I am endeavouring to get you the data about the Siemens machine. I dont know just how I will

do it but I will try and find a way. I am conducting a siege against Siemens with a view of bringing about an amicable arrangement of the armature question. We have decided that if he is reasonable, we will adjust this matter with him by paying him a royalty, but that if he is unreasonable we will fight him. The first approach has been made by Dr Hopkinson as our Plenipotentiary and with satisfactory results. He finds that Siemens is prepared to deal with us in a proper spirit and thinks that we can make a very easy arrangement with him. At all events he is bringing Siemens to the Viaduct to see us and to see the machines in operation. I think it not unlikely that we shall make an arrangement with him either by the payment of a direct royalty or by a contract for the manufacture of our dynamos or at least of the large heavy iron parts, you supplying the armatures &c. I will have the subject of regulating the field by an adjustable resistance particularly investigated

3/

but I am of the impression that when we were on that subject before we found that your patent ~~failed on two~~ was good — There is no doubt in my mind at all that they will all want to use this sooner or later (Siemens among the rest.) I have called attention to this and to its bearing on our present negotiation with Siemens. Of course I have not lost sight of the fact that our machines will run more lights than the Siemens machine. I have asked Sir Wm Thomson in his experiments with our machine and with the Siemens machine to let me know exactly what the difference is. It is the absence of accurate knowledge of the effective capacity of the two machines which prevents me from stating the facts in my circular and thus justify the price. I shall be very glad indeed to get some of your high candle power incandescent lamps. They would be of extraordinary value in the Crystal Palace Exhibition. As soon as you get any, please dont lose a moment in sending a few on to me.

4

I have been a little astray in regard to the capacity of the big machine. I understood all along that of your 10 per Electrical HP lamps we could get 8 per indicated H.P. from this machine. You now tell me 6 3/4. I am afraid this will be a disappointment to our people.

You said you were going to send me some new brushes for the little dynamos. They have not come to hand — did you ever send them? No, the Savoy Theatre is not a success; the amount of power that is expended there for keeping up 1200 lamps (which do not average more than 5 or 6 Candles) is something prodigious. I hope the 2000 new lamps I ordered will be first quality in every respect. I shall put them in operation in Crystal Palace, although to do so I will have to change the old sockets for the new. I am glad to have your information about the Maxim light which will assist me materially in answering questions which I am frequently asked. They have not

done much here, in fact the Manager of the Company which controls the Maxim lamp openly denounces it as a complete fraud. It is impracticable to have any surrillance of the Swan lamps. The only place where it could be at all possible would be at the Saroy Theatre, and that of course is out of the question since it could be only accomplished by the connivance of the manager who is himself in America. We have 500 some odd lamps now in nightly operation at the Crystal Palace. No one else has yet shown over 50 incandescent lamps. Our display is in fact the one object of interest at Crystal Palace so far. Our Exhibition will be the most complete ever made by anyone. I have arranged your Exhibits in the room which is to be my headquarters in the order of their insention and classification; the first Section, being a space entirely across one end of the room, is devoted to your Contributions to type printing telegraphs; the next section to your duplex and

quadruplex telegraphs, the next section to your messenger & general call service telegraphs; to one side of the centre stand is your electrical pen. The central stand is a large square table immediately under the Chandelier and about 10 ft square, in the centre of which is erected an octagonal structure upon which are placed various samples, pictures &c &c. Around this are show-cases in which are placed your various miscellaneous inventions and the experimental apparatus which show the steps by which your telephone and other inventions were led up to. Surrounding this is a complete demonstration of all your telephones and your various scientific apparatus including the tasimeter, the pressure relay, the motograph relay &c &c arranged and classified in their proper order. The stage is occupied by your Phonograph, Musical Telephone, & Loud Speaking Telephone, which will be in constant operation and in first class condition throughout the Exhibition. Above and surrounding all is your last

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contribution namely the Electric Light. To one side in an alcove formed by a closed doorway we are placing a L. dynamo to run as a motor and mounted on top of it will be a little 15 light dynamo driven by it and from this small dynamo we will supply a few lamps. Of course the current to drive the motor will be taken from the main system. I understand that some of the other Companies are expressing some disgust with the Exhibition saying they wish the damned thing had never been thought of. The fact is we have by being in advance of everybody else and by the completeness of the work we have done, as well as the magnificence of our display, stolen all the thunder the Exhibition has to give. Others may come after us but they are simply dropping along in our footsteps and there are but few crumbs of comfort for them to pick up. Good bye

Very truly yours

Edwd. H. Johnson

P.S. I understand there is a movement on

8/ foot to formally invite you to come to this country. What do you say? Suppose I get the Holborn Viaduct and Crystal Palace in full blaze with about 2000 lights and everything working perfectly smooth, don't you think you could afford to take a month and come over here? It would be money in your pocket; the fact of your presence here I am quite sure would give a stimulus to your various enterprises which would nett you a very considerable enhance of values on your shares. They certainly could run things for 30 days in New York without you. I should like to have you here in April. The Crystal Palace Company have arranged for a series of popular lectures on Electricity. The first four are to be given by Sylvanus Thompson, after which Siemens is to give one on his light, Swan on his, Lane-Fox on his, and I am asked to give one on yours. They will not permit any of us to employ a professional lecturer for the purpose. If I go in for it (as I suspect I must)

9

You may rely on its being properly done although it will not probably be as scientific or technical as some of the others. These lectures are to be held in the Concert Room which is of course lighted by your lamps. It is now conceded on all sides that we displayed the best judgment in the selection of our site — Good-bye —

E. H. Johnson

Enclosure

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD. H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. Feby 19th 1882

Thomas A. Edison Esqr.
New York.

My dear Edison, I enclose you a copy of a Letter which has been received by Mr. Preece from Rio de Janeiro. It tells its own story. You can deduce your own moral. Your man will probably be surprised at your having other sources of information as to his doings than those directly emanating from him. I have written a long Letter to Mr Fabbri explanatory of Contract matters and as I have just one bushel of letters to answer today I am not going to repeat it to you. You and he can get your heads together and read it.

Insull tells me in one of his letters what you are doing with Dyer. I hope when he gets that Digest ready and knows all that he can know on your side of the water that you will send him over here to me. I consider it very important; he need not be here longer than a week in order to put your Patent matters for the future in first class shape.

I have had a call from Dr Siemens in company with Sir Frederick Bramwell and Dr John Hopkinson and have opened negotiations with him in regard to the Dynamo. I was advised by everybody to deal with him in a perfectly frank manner and I did so as far as was possible without conceding infringement. He received my advances in a very satisfactory manner and

2/ intimated that he was quite ready to consider the question with us and if we an examination by proper Experts we were advised that we infringed his Patent he was prepared to arrange reasonable terms with us for the use of it. Dr. Hopkinson says that his usual terms are 5 per cent and he thinks that we would certainly not be asked to pay more than that. Siemens was very much pleased with the manner in which he was Entertained and the freedom with which everything was shown and explained to him and expressed himself as desirous of working in harmony with us. Waterhouse has tendered him the opportunity of purchasing a share in the Company and has also tendered one to Bramwell. The latter however pleads poverty and says that he cannot afford to invest so large a sum but in conversation with me intimated that he would be largely guided by the advice of Siemens; - in point of fact I think he is very largely controlled in such matters by Siemens. I do not know what the upshot of it all will be but am of the impression that we will either pay Siemens a royalty, make an arrangement with him for the manufacture or secure him as a Shareholder or all three. I have done nothing more with Covent Garden Theatre as yet but expect to see the parties again this week and give them a definite Estimate for doing the work. I hope then to receive the order and to Cable you to go ahead with the Machines.

If I do you must supply them within the time specified without fail as we shall have to engage to finish the work within a given time and give a guarantee therefor in view of the fact that the House must be lighted for the coming Opera Season which is earlier with us than it is with you. I have a letter from Ewell asking me to look at the Elevator in 11, Queen Victoria Street with the idea of adopting it to Electric motors or rather of adopting motors to it. I know all about this Elevator and am satisfied there is not the slightest difficulty in working it by Electricity. There is one thing to bear in mind and that is that in a large building you are liable to have people all going in one direction, that is to say, all the ascending cars may be filled and the descending ones empty or vice versa This throws a great strain upon any regulating device for keeping its motion steady. It moves comparatively slow for Elevated Railway purposes. As there would be but one landing place this difficulty would not be so great but I am of the opinion that this Elevator for such purpose would not be popular. I have always noticed that women in getting in or out of it invariably do so so awkwardly that they either fall or receive a severe jolting. For instance when the Car is ascending instead of stepping out just before the footboard of the car reaches the level of the platform upon which they are to step, they invariably hesitate until after it has passed and then go to step

down and miscalculate the distance and flop out much to the detriment of their nerves. You would not be able to induce females to patronize it. On the other hand men like it with one exception, namely, that when they are in a hurry it moves too slowly. Imagine yourself rushing for a train that was just approaching the Station and instead of bounding up the Stairway 19 steps at a time you stepped into this Car and was slowly hoisted to arrive just in time to — see the gate shut in your face. Besides this you would have to have a considerable of a well beneath the surface for the cars to pass over the wheel and a similar projection at the top as it would not do for people to step into the car or out of it as they were passing sideways over this wheel. It is awkward to have to accommodate yourself to two motions at once. The car both at the lower level and the upper level must be moving in a direct line at the moment when people are stepping in or stepping out. If you can only make the cars like your lamps to carry one load and then expire the thing would then be a success. Cannot you discharge them at the top in the form of vapour and thus have them run always in one direction? You will observe I am suffering from a dearth of ideas and shall therefore have to cut this letter short. I dont thinck you may expect any brilliant scintillations from me until the arrival of the two big machines, namely, the California Hoosier and the big Dynamo. The Candle power indicators

have arrived and Hammer is preparing to give them a thorough test to let you know the results. Good bye.

Very truly Yours.

My Dear Friend I received your letter for Signature

Yours Truly

Chas. H. Schumm

P.S. I drink with my friend the Duke of Edinburgh on Saturday the 20th at the Imperial Palace

S.H.

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. 7/20th 1882

My Dr Edison

Yes - I am glad to have this. It is a great satisfaction to feel that now you know that things in England are moving along all right -

Yours

E. H. Johnson

File

6, Lombard Street, E.C.

London Feb 20th 1882

To T. A. Edison Esqre
65 Fifth Avenue New York.

Solano Light

My dear Edison,

I beg to confirm the receipt of your cable of the 18th inst "Signify" which in accordance with my letter of the 28th ults, I understand signifies that you do not approve my taking any part in this matter. I am glad of this as I never felt at all anxious to interest myself in it, though it came to me with such strong recommendations: and now every day's experience seems to show that the popularity of any arc system of lighting is likely to decrease, just in proportion to the spread of the incandescent.

Yours very truly

[signature]

12, Queen Anne's Gate, Westminster
London 22nd February 1882.

Siemens Bros & Co.
Limited.

Dear Sir,

Reverting to the visit Dr Siemens paid to you and reciprocating the amicable feeling which dictated your invitation, we should feel disposed to grant you a license for the use of our patent armature as applied to the "Edison" dynamo-electric machine or any modification of the same, embodying one or more features covered by patents obtained by us in England, provided we receive for every machine a royalty of seven and a half per cent on its gross selling value, not matter whether such machines are actually sold or whether they are employed in central stations or otherwise to supply Electric Currents to customers

Such an arrangement would have the advantage of simplicity and would leave the way open to any further agreements at a future time.

We are Dear Sir,
Yours faithfully
Siemens Bros & Co Limited.
Ch Siemens.
Chairman

E. H. Johnson Esq.
57, Holborn Viaduct
EC.

[ATTACHMENT]

(Copy)

The Edison Co. Ltd
London 23rd February 1882

Messrs. Siemens Bros & Co. Limited
12 Queen Anne's Gate
Westminster S.W.

Dear Sirs

I beg to acknowledge your letter of yesterday indicating your disposition to grant a License for the use of your Patent Armature as applied to the Edison Dynamo and Electric Machine or any modification of the same embodying one or more features covered by Patents obtained by you in England, provided you receive for every Machine a Royalty of 7½% on its gross selling value no matter whether such Machines are actually sold or whether they are employed in Central Stations or otherwise, to supply Electric currents to Customers.

In view of the fact that Mr Edison's Dynamos are of expensive construction we had not contemplated so high a Royalty as 7½%. It would seem to me that 5% might be a reasonable and fair amount, and this I would recommend to Mr Edison for his acceptance if agreed to by you. Will you kindly let me have your further views and oblige

Yours faithfully
Edwd. H. Johnson

(Signed)

[ATTACHMENT]

12 Queen Annes Gate
Westminster.
London S.W. 25th February 1882

Siemens & Co.
Limited.

Dear Sir.

We are in receipt of your letter of the 23rd inst and we are glad to see that we agree so far as regards our granting Mr T.A. Edison a licence for the use of our armature in his machines

Your offer to recommend to Mr Edison to accept paying a royalty of five per cent is rather low, in order however to meet you to a certain extent we shall be willing to grant Mr T. A Edison a licence with the usual clauses, as may be agreed upon, upon his undertaking to pay us a royalty of six per cent subject to the conditions mentioned in our letter of the 22nd inst.

We are, dear Sir,
Yours faithfully
Siemens Bros & Co. Limited
Ad Siemens.

Edw: H. Johnson Esq.
57 Holborn Viaduct.
EC

[ATTACHMENT]

Copy

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. 11th Mch. 1882

Dear Sir

I was duly in receipt of your letter of the 25th ultimo expressing your willingness to grant Mr Edison a licence at a Royalty of 6% subject to the conditions mentioned in your previous letter. Since receiving your letter of the 25th I have had a long communication from Mr Edison on the subject of your machine & find that he is by no means convinced that he does infringe. At the same time I know that both he and the gentlemen likely to be associated with him here would be very sorry to trespass upon the rights of another inventor and believing myself that there is a bona fide doubt upon the point I am ready to advise that the 6% now asked you be paid

I am Dear Sir
Yours faithfully
Edwd H Johnson

Wm Siemens Bros & Co
Ltd

File Powers of Atty Seed 6/4/82

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD. H. JOHNSON, MANAGER.

57, Holborn Viaduct.

London, E.C. February 25th 1882

Thomas A. Edison Esqre
New York

My dear Edison,

The Power of Attorney here and the one to arrive are alike insufficient for the purpose for the purpose for which they are intended. It is now ~~understood~~ discovered that assignment can only be made in the Colonies. The whole character of the transaction is therefore changed. In lieu of an assignment we enter into an agreement to assign or in other words we effect a down right sale receiving the entire sum in cash on signing the agreement No Bills of acceptance. The Power of Attorney required by me to effect this transaction must be of a sufficiently broad character to enable me to sign the agreement and to sign an auxilliary agreement conferring other powers on some Attorney in the Colony which Attorney will effect the final assignment of the Patents. In order not to

perpetuate this farce of sending papers from your side over here which on their arrival are discovered to be insufficient I have requested Mr Waterhouse to prepare a proper Power of Attorney here and forward it to you for your signature. It goes out herewith. Please cable me immediately on its receipt that you have sent it and mailed it per Steamer.

Gouraud is taking out Patents for the Cape of Good Hope. I have been in consultation with Stanford and we are taking out a Broad Patent on the Lamp including all those details which are now practically used. We find that these applications must be signed with your name but it does not matter whether they are signed by you or by someone authorised to apply your Signature. In view of this I have cabled you to authorise me to write your name and await your response. I presume the matter is all arranged between you and Gouraud as to taking out these Patents. I have received no notice from you either that that this is in order or out of order.

Francis and Mac: have arrived O.K. The Dynamo is transhipped to London by Rail

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and a fortnight hence we shall be in full operation. I am sorry the 100 candle power Lamps have not come to hand although even if they were here I should find it somewhat diffiucult to utilize many of them owing to the power they require. I have tested with 16 Candle Lamps (2 in each Lamppost) and find them insufficient to effect that degree of illumination which I desire to see in order to produce a favorable impression. True we have 4 times as much light as there was before but then there was not much more than One Eighth as much before compared with what the street requires. In view of this I cabled you today to send me Two or Three hundred 30 Candle Lamps to work on our main Circuit. I hope you will be able to do this as this is the one feature in our System which is not to my entire satisfaction.

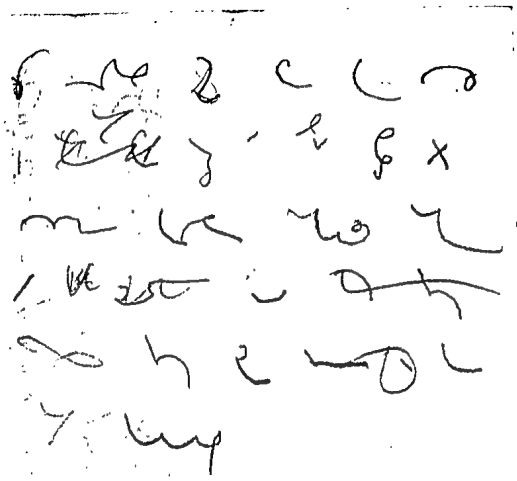
I leave this to be signed by my Stenographer as I am leaving for the Palace to attend the formal opening of the Electrical Exhibition. Very truly Yours,

Edwd. H. Johnson —
Per Geo. Hayes

English Light

Feby 25-82

Johnson



Miscellaneous

Ashley's Hotel,
COVENT GARDEN,
LONDON.

Feb 26th/82

Dear Sir

After a very successful voyage I arrived in London on Friday afternoon Feb 24th. I found Mr Johnson in his office and was very much surprised to see what headway there has been made by him. Every suggestion that could be possible, I see has been carried out by him, and every thing above and indicates that no pains have been

spared, nor has there been any lack of judgment in the plan that he has adopted. It is my candid opinion, that as far as display and exhibition goes, there has been more done in London, that has a tendency to quiet public opinion, and harmonize scientific discords, than in New York. He has the shops on the viaduct, the street lamp posts and a church all lighted up, or rather filed up. The foundation of the engine is fourteen feet deep and is solid, producing no tremor when running, as he ran that evening, and I witnessed the operations. On the first floor he has his regulation apparatus and a miniature plan of a central station, and all his offices up stairs and rooms are fitted up well. The grandest thing is the display at the Crystal Palace, the entertainment court where all your inventions are exhibited, the center of attraction being the flower chandelier with 99 lamp, and also the large concert space which is lighted. Of all exhibits in or on electricity

The Edison one is the finest and best.
The Duke and the Duchess were in the Palace yesterday, and there was an ~~[illegible]~~ unusual crowd there, they stopped at the Edison Exhibit for nearly one hour, being very much pleased, and would have stopped longer had not old Crompton (who has a dilapidated arc lamp on exhibition) gone up to their highness, and inform them that they would not have time for the other exhibitions, if they stopped at the Edison's Exhibit so long. When they came to the Swan exhibit, his lamps went ~~off~~ out, and they waited five minutes and then went away, not seeing them.

hoping you are well

I remain your Respt.

Francis Jehl

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD. H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. Feby 20th 1882

Thomas A. Edison Esqre.
New York.

My dear Edison,

You will see by the papers that Crystal Palace Electrical Exhibition is now formally opened. Lane-Fox, Swan & Maxim are making prodigious effort to rival your Exhibit and last night Maxim had a Chandelier with 96 Lamps on it ~~and~~ a very gorgeous Crystal affair but producing such a blaze of Light as to offend the Eye; it is consequently a failure. He has some other smaller Chandeliers however which are more satisfactory but they are all on the lines of Gas Chandeliers nothing new or particularly novel. Swan is exhibiting one or two long sweeping Stem arrangements like he had at Paris - nothing new. The Brush Company are however exhibiting a Crystal Chandelier with Lane Fox Lamps the bulb of which is White Porcelain. The effect is very beautiful as the lamp is simply a white bulb of light. The Arc Lights throughout the building were very generally in operation and altogether the Palace now begins to look like a complete affair. There

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were upwards of 25.000 or 30.000 people at the Palace yesterday and altogether the thing may be said to be fairly launched and a creditable display. The Duke and Duchess of Edinburgh were the Royal Visitors on the occasion and were Entertained at a private dinner to which a select few were invited myself among the number. The party arrived at the Palace at 1/2 past 6. They passed first through the Concert Room where your lights received their hearty admiration. They then passed down through the various Exhibits at the South End of the Palace, took a view of the entire length of the Palace from the Clock Tower and returned through Siemens' arc light Exhibit to the Swan Exhibit in the Picture Gallery and were there detained 5 minutes waiting in vain for Swan to get his Lights in operation and from this abortive attempt they came immediately into the Entertainment Court where I with White Kids and Swallow-tail awaited their arrival, the doors having been kept closed throughout to keep the general public out but a large number of privileged persons were already admitted by Card. Among these were Mess.rs MacLoughlin Logan, Francis &c late arrivals from America who will doubtless report to you their impressions Receiving Royalty is a new role for me and I had no advice but was informed afterwards that I did the thing in a creditable manner. At all events their Royal Highnesses were so

3

interested in what they saw and so pleased with the beauty and taste of the entire display as well as with the completeness of all your work that they remained so long in your rooms as to preclude their visiting the North End of the Palace so that they went directly from the Entertainment Court to the Dining Room thus omitting entirely to visit Maxim, Lane Fox, Brush &c which was of course a sore disappointment to these people. At the Dinner Table the Duke referred only once to what he had seen and then in terms of admiration and great animation at the completeness and beauty of Mr Edison's Work. The conversation on this subject was carried on between his highness and Professor Spottiswoode across the Table and was therefore distinctly heard by Messrs Swan, Siemens, Brush, Maxim or their representatives who were guests at the Table. I was assured on all hands that we had scored heavy, that in point of fact the Royal party which was composed of a large number of other distinguished persons besides the Duke and Duchess, would leave the Palace with but one impression, namely, that the only thing shown them worthy of their special attention and admiration was Mr Edison's Exhibit. The Chairman of the Crystal Palace Company whispered in my ear as the Royal party were leaving that he had something exceedingly important to communicate to me but that it was impossible for him to do so there and he wishes to see me

early this week. He said that the Duke was full of Edison and could talk of nothing else. Of course the Chairman's place at the table was between the Duke and Duchess and he consequently knows their minds. I am somewhat curious to know what he has to communicate – will advise you in my next letter. I will leave to the papers and to your occasional correspondents McLoughlin, Francis and others to give you a better idea of the complete success of the Evening to us and its consequent failure to other Exhibitors. I shall now have to spend a considerable portion of my time at the Palace. The various Corporations &c throughout the Country are sending Deputations to the Palace to investigate the subject of Electric Lighting. It is absolutely necessary that someone capable of properly setting forth the merits of your System should be present. In the absence of any other I shall have to do this work myself. Fortunately it is night work as the Exhibition is only of interest in the Evenings. I shall therefore be able to give it considerable attention.

Very truly Yours,

Edwd. N. Dawson

The papers of course represent that all the Exhibits were viewed by the Royal Party – but as a point of fact such was not the case.

– The Duchess asked me whether it was likely you would be coming to England soon – END

English Light
Feby 29.82
J Johnson

Special GOLD MEDAL, Paris Electrical Exhibition, 1881.

Swan's Electric Light Company, Limited.

13, Mosley Street,

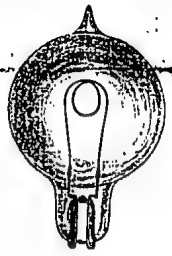
Newcastle-on-Tyne,

1st March, 1882.

Swan's Electric Light Company, Limited, have made great improvements in the manufacture of their Patent Incandescent Lamps, and are now able to supply them at Five Shillings each.

These Lamps give a light of about 20 candles power, and are specially suited for lighting Mansions, Dwelling Houses, Shops, Factories, Collieries, Theatres, Steamships, etc., to all of which purposes they have been applied with the most satisfactory results.

By the use of Swan's Incandescent Lamps a brilliant white light is obtained without any vitiation or heating of the atmosphere. It is perfectly steady and beautifully soft.



LAMP.

Swan's Electric Light Company's Improved Lamp, as shown in sketch, 5s. each.

LAMP, WITH HOLDER ATTACHED.

HOLDER.

Patent Spring Holders for same; as shown in sketch, 1s. each.

NOTE.—Quantities of 50 Lamps and upwards will be forwarded carriage paid.

Swan's Electric Light Company, Limited.

DYNAMO-ELECTRIC MACHINES.

Swan's Electric Light Company's Lamps can be worked by currents supplied from any of the many forms of Dynamo Machines now in use, but it has been found from experience that it is much more satisfactory to use machines which have been specially arranged for use with these lamps. Messrs. Siemens Bros. and Co. have gone very carefully into this question, and have prepared a variety of machines, which are admirably suited for working these lamps to the greatest advantage.

The following is a Price List of some of these machines for working from 12 lamps up to 200 lamps:—

TYPE OF MACHINE.	Number of Swan Lamps.	Diameter of Pulley in Inches.	Width of Machine Strap in Inches.	Approximate Number of Revolutions per Minute.	Approximate Horse-power Actually Required.	Price Delivered in London exclusive of Packing.	Price of Extra Fly Wheel for use with Gas Engine.
						£ s. d.	£ s. d.
Direct Current. SD5	12	4½	2½	1,500	1½	40 0 0	7 10 0
Direct Current. SD7	*25	6½	3	950	3	57 0 0	8 0 0
Direct Current. SD2	*40	8½	3½	600	4	100 0 0	9 0 0
Alternating Current. W3/D5	60	8/4½	4¼/2	750/1,100	6	120 0 0	.....
Alternating Current. W6/D6	80	8/4¾	4½/2½	650/1,000	8	145 0 0	.....
Alternating Current. W2/D6	120	10/4¾	6½/2½	650/1,200	12	170 0 0	.....
Alternating Current. W1/D7	200	12/5½	9½/2½	650/1,200	20	225 0 0	.....

* By arranging the Lamps in series these Machines can be made to light about twice this number of Lamps.

3.

Swan Co.

SWAN'S ELECTRIC LIGHT COMPANY, LIMITED, are prepared to give estimates for providing and fixing their Incandescent Lamps complete with Dynamo Machines, insulated leading and branch-wires, fittings, etc.

Lamps and further information may be obtained from

SWAN'S ELECTRIC LIGHT COMPANY,

13, MOSLEY STREET, NEWCASTLE-UPON-TYNE.

DREXEL, MORGAN & CO.
Wall St. Corner Broad,
New York.
DREXEL & CO.
Philadelphia.
DREXEL, HARJES & CO
Paris.

New York — March 2 1882

S. Insull, Esq
65, 5th Ave
City

Dear Sir,

Herewith please find docts relating to shipment of lamps per "Assyrian Monarch" to E. H. Johnson, London, sent to us by the Edison Lamp Co. As you are aware our a/c with the London plant has been closed & further supplies must be paid for there. We have advised the Edison Lamp Co that we will send the inclosed documents to your goodself and would ask you to give them your attention.

Yours truly
Drexel Morgan & Co

8 Enclosures

Enclosures

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. March 4th 1882

Thomas A. Edison Esqre
65. Fifth Avenue
New York.

My dear Edison,

I enclose you Mr Bidwell's observations on Mr Dyer's Report and on your Letters. You will see that we are not materially affected in respect to the Siemen's matter by your arguments but that you have contributed an important item in respect to the occlusion of gases, in calling our attention to the fact that your process is still used for the exhaustion of the air from the metal which constitutes the clamps. Our negotiations have gone so far as per enclosed copy correspondence. We are now responding to Siemens accepting 6 per cent and I think that this recognition by you of Siemens, although it is just possible that you might ultimately be able to avoid him, will do you far more good than it will cost. It gives you a high moral ground to stand on in asserting your rights with others. I have much to write you about but this being Saturday and work overwhelming it is impossible for

2/

me to do more than give you this hasty letter in order that it ~~might go off by this~~ Mail. Tomorrow (Sunday) I will let you have a detailed account of my doings for the past 10 days.

Very truly Yours,

Edw. N. Johnson

[ENCLOSURE]

Copy

Light and Resistance

In Mr Bidwells paper just at hand he makes this supposition "Suppose we have two uniform conductors of the same material and similar cross section let the two have equal radiating surface but let one of the conductors be n times as long as the other". I know nothing about Joule's formula nor in fact am I in the least acquainted with mathematics but I do understand something of logic. I fail to comprehend how one conductor of a certain cross section of one length can have the same radiating surface as another conductor of the same cross section but of different length. Since therefore I cannot understand Mr Bidwells premises I of course cannot follow his reasoning but I will endeavour to point out in it what seems to be fallacious. I quote again, "Then if one

[ENCLOSURE]

2/ ampere of current will develop a certain number of units of heat in the longer conductor it will require a current of $\sqrt{n^3}$ ampères to develop an equal amount of heat in the shorter, or to put the case in another form, if a current of one ampère will develop one unit of heat per second in the shorter conductor the same one ampère will in an equal time produce n^3 units of heat in the longer conductor". I think the fallacy here lies in the fact that Mr Bidwell is discussing the problem producing heat and not the problem of producing light. It is possible to produce a considerable amount of heat without producing any light and then again a very infinitesimal quantity of heat may be made to give a brilliant light. The production of heat may therefore follow one law while the conversion of that heat into light that we are discussing and in that matter

[ENCLOSURE]

3/ my contention is that with a given amount of energy acting upon a given radiating surface, a given amount of light will be obtained, whether that radiating surface be so arranged as to form a single unit of resistance or 1000. If in the process of reducing the resistance of the radiating surface it be given additional conductivity by the addition of extra integral mass than Mr Bidwell would be right because extra energy would have to be expended to heat this additional body ere the proper effect would be had upon the radiating surface. In all my arguments I have assumed that in maintaining a certain radiating surface I was at the same time maintaining a ~~certain radiating~~ the same total mass. Now as a given unit of energy must produce upon a given mass of matter a given amount of heat whether that mass be in one shape or another it follows that if the same surface of this mass is always exposed you must obtain as a result

[ENCLOSURE]

4

of this heat the same unit of light. Mr Bidwell will see that in my illustrations I have maintained the same mass of matter in subdividing the carbon filaments as is contained in it in its present form and I must insist that with this one unit of material arranged to have but one unit of surface that one unit of heat acting on it must in a given time produce a like unit of light no matter how the subdivided sections may be arranged, and further, that they may be differently arranged while at the same time maintaining the same mass and surface and yet varying enormously the aggregate resistance. I think my communication of Saturday will amply demonstrate this. The resistance offered by individual molecules of the matter determines the ratio of heat produced to energy expended; the arrangement

[ENCLOSURE]

5/ of these molecules is a matter of no consequence in so far as the production of a unit of heat with the unit of energy is concerned, but it has greatly to do with the determination of their aggregate resistance. We cannot of course change the resistance of a single molecule nor can we change the fact that this molecule will absorb a certain amount of energy and produce thereby a certain amount of heat, but we can so connect these molecules in a circuit in such way that they may offer a resistance in the line of that circuit of many hundreds of ohms or of an infinitesimal fraction of one ohm.
I think Mr Bidwell will absolve me of any intention of limiting the discussion to the simple problem of determining whether or no "the heat developed in a conductor is proportional to the Electrical energy expended in that conductor whatever may be its resistance". We have both a number of times agreed upon that.

[ENCLOSURE]

(6) "What we are at present discussing is the conversion of this heat into light which I think is the point that Mr Bidwell fails to grasp. It is quite possible to have a certain given unit of heat in a conductor without having light at all, while it is equally possible to have a fraction of this ~~heat~~ unit of heat converted into a brilliant glow of light." There is no direct method of converting current electricity into heat except by opposing resistance to it". In this I entirely concur but I must repeat that the resistance so opposed being determined by ~~electric~~ the character of the matter, that matter may be arranged in an infinite variety of ways without changing its molecular resistance so to speak and therefore without changing the result produced by it by the action of a given unit of energy yet permitting an infinite variation of the resistance the aggregate

[ENCLOSURE]

I mass may offer in the line of the path of the electric energy, thus this body of matter may be arranged in such way as to obtain a uniform conversion of a given quality of electric energy into light utterly regardless of the resistance it offers as a section of the conductor being traversed by the electric energy. Therefore whether its arrangement is such as to offer an aggregate of one Ohm or an aggregate of 1000 Ohms resistance is a matter of no consequence to the problem of economically converting that unit of energy which is action on it into light but its is of every consequence to the problem of concentrating upon it the maximum of percentage of the energy which is at our disposal, that is to say that if an electric lamp was like a coal oil lamp complete within itself the bowl forming a reservoir of electricity in which reservoir there was an infinitesimal resistance then whether the resistance of the carbon was 1 Ohm

[ENCLOSURE]

8/ or 1000 Ohms would be of no consequence or rather it would be of consequence that the resistance should not be more than 1 Ohm for in this instance, resistance would be objectionable. In point of fact we have no record of anyone except Lane-Fox and Edison seeking for high resistance, but on the contrary have plenty of internal evidence in the sayings and works of other investigators that their dream was of a carbon of such low resistance as that it might be worked with a cell battery or worked with a Dynamo machine by placing a great number of lamps in a series in which case the lower the resistance the better, only Lane-Fox and Edison recognized that inderdudality was only obtained by constituting each lamp a circuit within itself thereby rendering it imperative that great resistance should be had in order that the aggregate resistance of a vast number of these circuits would not come below the resistance

[ENCLOSURE]

9

of the source of supply nor approximate the resistance of the main supply of the conductors "tapped" by these multiplied lamp circuits. Were Lane-Fox and Edison himself not in the way I am of the opinion that a very broad claim could be made for this combination of high resistance with a small body still as it would so have to be made in combination with a practical means of obtaining it, I do not think that either Lane-Fox or Edison himself with their platinum, and platinum iridium or other impracticable compounds could stop Edison from making a good claim to the combination of these two features with a thread of carbon

Respectfully
Submitted

Edwd. H. Johnson

Insull

THE EDISON ELECTRIC LIGHT SYSTEM.

Sehl.

EDWd H. JOHNSON, MANAGER.

57 Holborn Viaduct.

London E.C. Mch 6 1882

Friend Insull

I have arrived at last in your native city, and have just settled myself in a comfortable place in South Kensington, Elm Place, I suppose you know it is. I done as you advised me to do, by going to Mr Kingsbury, who not knowing any place, put an advertisement in "The Telegraph". I received about three hundred letters, and visited some places near the office, but they were all very bad, and the only places that suited me were about Kensington and in that neighborhood. London is a large and great city, and a stranger is very easily lost. I lived the first week at the Ashely's Hotel, in Covent Garden, but the place and neighborhood is so populaciddy and the streets so narrow, that I did not like its much. Piccadilly is a very fine street, and as ones goes out of London, everything seems to brighten up. St James and Hyde Parks are very beautiful and I pass them whenever I go down by the "Bus". I was at Crystal Palace the other day, and I must confess it is a grand affair, and one can spend a day there very easily, and not notice the time fly by. I have not as yet been to many places of amusements, the only place

that I have been was "The Royal Aquarium" and when there I failed to see where the fish came in. The place was saturated, ~~with~~ with fair children of sin.

I was very much surprised when I saw Johnson's office, how well he has it fitted up, and also the exhibit at the Place, which is beyond comparison; it is the best show of its kind, there.

Talking of sea sickness, why I was not ill compared with Mc Loughin and others, I was always able to go on deck, but he was not, being confined nearly all the time to his room.

hoping every thing is well

I remain

Truly yours

Francis Jebe.

Ans 21/3/82

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON
MANAGER.

57, Holborn Viaduct.
London, E.C. March 7th 1882

Samuel Insull Esqre
65. Fifth Avenue,
New York.

My dear Insull,

Your two Cables about money matters just received and I very much regret to say that I cannot do anything in the matter until the Company is registered and some of the Shareholders put up their money, or in other words, until the Treasury is established there is no one here to pay money. It seems to me that you, and you alone, are to blame in the matter. When Mr. Fabbri made up the expenditures in America it was not a wise thing to include in the account only that money which had been paid. It should have included not only what had been paid but that amount which would cover all the orders that you had for me, for the Armington Engines especially I seems to me you should have provided. How

2/

comes it that you were so short-sighted as to omit all these things? Here I not only provided for the amount of money which had actually been expended but added a couple of thousand pounds to meet the contingency naturally to be expected that there would be an interim during which noone would be authorised to pay out money. You seem to have acted upon the idea that the very moment the papers were signed in New York a Treasurer would be available to draw upon. This was your mistake and one that you especially should not have made with your knowledge of how such affairs are conducted. As the matter now stands there is noone authorised to pay on behalf of the new Co. There is no money to my credit except the residue of the £2000 which I myself took care to provide for and I am rapidly absorbing, consequently I cannot send you any money and Waterhouse and his people have as yet

3

no authority to do so. The Company will be registered on Thursday and the shares allotted and payments made thereon immediately after but as you know, this is at least a fortnights work so that it is not at all probable that the Company will take over my plant here and instal themselves in my place within a less time than a fortnight or 3 weeks. Meantime there is but one way by which you can be recouped for your outlay and that is to secure a prompt remittance to you of the £20000 derived from the English Agreement or to get some money out of Gourand. The latter is like getting blood out of a turnip but I set about it immediately on receipt of your telegram and am in hopes of having some cables to you, within a few days. Meantime I am also endeavouring to hasten the remittance on the part of the English people. I write you this hastily to go by next Mail in order that you may see that I appreciate the situation and am doing what I can. Your various letters must await a more favorable moment for reply. Very truly Yours.

Edwd H. Johnson

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct.
London, E.C. March 8th 1882

Mr R. N. Dyer

My dear Dyer.

Please send me another copy of your Digest immediately. I wish it for the Solicitor of the new Company. I have given the one you sent to Mr Hansford (your Colleague to be). One is in the service of Mr Edison personally in respect to future patents; the other represents Mr Edison's interests in the Light Patents of the past.

Yours very truly

Edwd H. Johnson

Richd N. Dyer Esq
Patent Dept
65. 5th ave
New York
U.S.A.

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

57, Holborn Viaduct,
London, E.C. March 9th 1882

Messrs
The Edison Machine Works,
Goerck Street,
New York.

Dear Sirs,

As the Company to work Mr Edison's English Patents for the Electric Light is about to be registered I am directed to place myself in communication with you, with the view of enquiring the cost of Electric Light material manufactured by your Company. As it is not improbable that the English Company will require a large number of Dynamo Machines perhaps you will be good enough to bear this fact in mind in quoting prices.

I am, Dear Sirs,
Yours truly,
J. Moulton White

Miscellaneous
Mch 21. 82

RECEIVED
APR 3 1882
PRICE, WATERHOUSE & Co.
(S. L. PRICE, E. WATERHOUSE, & G. SNEATH)
ANSWERED
..... 188...

Waterhouse
44, Gresham Street, E.C.

31st March, 1882

Dear Sir,

I beg to acknowledge with many thanks the receipt of the first four very interesting bulletins relating to your Electric Light Company, and I trust that I may be put upon the list of those who are to be favored with a copy of future issues.

Yours, Dear Sir,
Yours faithfully,
Wm Waterhouse

T. A. Edison Esqre
65, Fifth Avenue
New York.

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD H. JOHNSON,
MANAGER.

.....188...

57, Holborn Viaduct.
London, E.C. March 28th 1882

Thomas A. Edison Esq
New York City

My Dear Sir

It is about time no doubt that you would like to know, what progress there has been made, and also the rapidity in meter work. Then also how soon I shall be able to go to Bath. Well! the first two weeks after my arrival, was spent in getting a room in order, and also in procuring such chemicals, and apparatuses as are necessary in meter manipulations. The balance that I have is a very fine one, and almost as good as the one you have in the Gerrick St laboratory, it was made by Oertling, the price being only 20 £. The Oertling folks are the ones that standardized all the government weights, and have that reputation in England, what Beacker has in America. The young man they gave me to instruct

in the meter line, was employed before he came into Edison Co in some chemists place, and he understands well how to weight, and take care of the balance. That's one comfort — I have had him all last week engaged on the zinc plates, the manner we prepare them, and also in making the standard solution, Also had him put a meter together, and which is now at Crystal Palace registering twenty four lights. As far as I have gone with him, I think he understands what I have told him, and now remains the electrical part, such as making compensation resistance, and also in making shunts. There is a great deficiency in this respect, the youths over here seem to lack electrical knowledge, some so under the impression that all that is necessary for electricians to know, is how to fix up batteries, and hang some lamps up &c. I doubt doubt, however, that I shall soon be able to teach him all that is necessary in a few weeks. Please let me know if you intend to have meters made in England? I dont

think it is necessary, in fact one would have to wait a long time, as everything is done at a very slow rate. (except eating) ——
I saw Baich, last week, he came over to England for the purpose of buying machinery, and stop'da day with us; and from what he tee'd me, the sooner I can get to him the better, as no doubt I can assist him a good deal in his place which he is now fitting up.
I saw our Hungarian prince (Mr Puskas) at the Crystal Palace the other night, and he is greatly pleased with the Edison display, and seems to be very anxious for the Paris place to be started and in working order, but the difficulties they have to contend with is surprising, the french law not allowing them to bring anything into the country; they being compelled to manufacture everything themself and can only use foreign drawings, hardly anything else. Talking of your exhibit at the Palace, I need not go into the details, for those are nearly all justly illustrated in the papers you receive, but I can say this, judging with impartiality, not being biased by any interest, that the "Edison exhibits" is the

faint there is. One never sees any fluctuation in the light, something which is always seen at the Swan show. In the British Electric Co's place there is a machine crossed almost every night, and yet these facts are never know to the public, they manage somehow to keep such things out of the papers, they have their machines next to our, so we can always tell when something happens. No machines crossed yet at our place. The marian lamps are burning now and then, sometimes I see them all ablaze and then other times they are stop'd, what the trouble is I dont know. One always finds the Edison lamps the first to be lit, and the last to stop. Billy Gladstone spent about fourty five minutes at the Edison exhibit the other night, and went through everything, and he is one of those duffers ~~that~~ who understand what you tell him. ~~xxx~~ While Johnson was explaining the system to him, one of Swan's men manage'd to get into our court, and did his best to get the Major that was taking the party around, to have him take Gladstone and his party into the Swan exhibit, but it would not work

Then when he saw that it was of no avail, he got one of his lamps and ~~wanted~~ wanted to have it presented to Gladstone but we gave him some of our lamps and the major told this snow agent that he would do no such thing. The Chief then took his departure ——.

I visited the South Kensington Museum yesterday evening, and there in the Patent office Museum, saw those instruments you gave to them some time ago, the Lasimeter Electric pen, chalk telephone, clock instrument Phonograph, and that paper carbon lamp, that burned 1390 hours. All these are on one shelf and your photograph in the center. Next to your lamp is a Lane Fox lamp, one I am sure that never had a current passed through it, the carbon is of a shape similar to our "A" lamp ones and is inserted into the glass glob ~~and~~ with black sealing wax, showing that it could not hold a vacuum. In front of this lamp is a small placard bearing the following inscription, "Incandescent Electric lamp Sir George Lane Fox letters Patent A.D. 1880 no 3494" Now perhaps you will remember

when you gave your lamp away to this museum you wrote the following words,
("This lamp was lighted 1390 hours and gave a light of 13 candles Thomas A Edison
Menlo Park Sept 15 1880")

Now looking at these two lamps, it seems to me that the object of The Lane Fox lamp there, is to try and deceive the strangers that visits the place, by making both lamps look as if there is no priority in either of them, as both bear the date 1880, ——
(Of course I might be wrong in this conception, and very unjust, to doubt anything, as the folks that reign over here are always actuated ~~actuate~~ by honesty and purity of intention and would under no consideration defraud you.)

Hoping you are well
I remain your
Obedient servant
Francis Jehl

We have received the prospectus of the Great Western Electric Light and Power Company (Limited). It states that the company has obtained a concession which has been granted by the Anglo-American Brush Electric Light Corporation (Limited), under which the exclusive rights of use or sale of their dynamo machines and arc lamps, together with a licence for exclusive rights of use or sale of the "Lane-Fox" incandescent lamp, is secured to the company for a number of counties in Wales and the West of England. The company intends to grant sub-licences to local companies in some cases, but it will also arrange directly with its customers, by establishing depôts in various towns for the supply of electricity. £27,750 has been paid for the concession. The Anglo-American Brush Company has granted a special discount of 20 per cent. on machines and lamps to be supplied by it to the Great Western Company. The company intends to supply electricity for any purpose its customers may choose, including storage in secondary batteries. The capital is £250,000, of which £125,000 is to be issued now in £5 shares. Three thousand of these will be issued fully paid up to the vendors, the remainder of the purchase-money being payable in cash.

Times Apr. 1

We have received the following letter as well as the communication which follows it from the Edison Electric Light Company (Limited):—

"London, E.C., April 1.

"Sir,—Observing in your money article of to-day notice of the formation of a company called the Great Western Electric Light and Power Company (Limited) with 'a licence for exclusive rights of use or sale of the Lane-Fox incandescent lamp for a number of counties in Wales and the West of England,' I am instructed by the Board of Directors of the Edison Electric Light Company (Limited) to inform you that the Lane-Fox incandescent lamp is a direct infringement of Mr. Edison's patents in this country.

"I am, Sir, your obedient servant,

"ARNOLD WHITE, Secretary."

"A company has been formed with a strong board of directors for the purpose of working Mr. Edison's electric light patents in the United Kingdom; Mr. Edward H. Johnson (Mr. Edison's well-known representative in this country) will continue for the present to advise the company on the practical application of the Edison system. Mr. Johnson will be assisted by Dr. Hopkinson, F.R.S., and Mr. J. A. Fleming, D.Sc., as electricians. Mr. Arnold White is the secretary to the company."

Times Apr. 3

The following letters refer to that of Mr. Arnold White, in Saturday's City Article, with reference to the Great Western Electric Light and Power Company:—

"London, April 3.

"Sir,—As owners of the Lane-Fox incandescent lights, my directors have read with surprise the letter signed by Mr. Arnold White in the Money Market column of *The Times* of to-day with reference to the Lane-Fox licences granted by my company to the Great Western Electric Light and Power Company (Limited).

"Such letter is palpably written for the purpose of damaging the prospects of the above company and diverting the attention of the investing public to the Edison Company.

"The notice in *The Times* is the first notice my directors or Mr. Lane-Fox have received of the alleged infringement, and they both deny that such infringement exists.

"It seems to my directors a matter of very questionable taste for Mr. Edison or those who are financially interested in his patents to seize the opportunity of making a statement of the positive character of a judicial decision at a time when the Great Western Electric Light and Power Company's (Limited) prospectus is in the papers, and when it is notorious that the Edison interests are likewise endeavouring to raise capital in this market.

"We have instructed our solicitors to inform the Edison Company that we hold them liable for any damages we may sustain in consequence of the libel contained in the letter, and in conclusion we must ask you to courteously give this letter the same publicity you afforded to the letter of the Edison Company.

"Yours faithfully,

"WILLIAM J. CORDNER, Secretary to the Anglo-American Brush Electric Light Corporation (Limited)."

April 3.

"Sir,—In your Money Article of to-day there appears a letter from Mr. Arnold White, Secretary of the Edison Electric Light Company (Limited), in which that gentleman states that he is instructed by his directors to inform you that the Lane-Fox incandescent lamp is a direct infringement of Mr. Edison's patents in this country.—

"As the directors of the Edison Electric Light Company have thus called the attention of the public to an alleged infringement of patents belonging to them, we are instructed by our client, Mr. John Banting Rogers, to inform you that we have some days ago, on his behalf, given notice to the Edison Electric Light Company to the effect that the division of the light adopted in certain parts of their plant is an infringement of our client's patent for the division and subdivision of the electric current, and that legal proceedings with reference thereto are imminent.

"We are, Sir, your obedient servants,

"PEDLEY AND BARTLETT."

Times Apr. 4

Exhibit "F"

THE EDISON SYSTEM OF ELECTRIC LIGHTING.

The inauguration in London of the system of street and house lighting which has been elaborated by Mr. Edison having been made, the period has arrived when, having before us an actual example, some definite account can be rendered and foundation for fair criticism obtained. What is it that he has attempted to do? The Edison "system" is the tangible reply to the question he set himself to solve in the way he individually thought best—"Is it possible to employ electricity as an illuminating agent, not merely as an accessory to gas or as useful in exceptional cases, but as a practical and reliable means of illumination, safe in use, readily adapted, certain in action, and accurately measurable?" This is a wider problem than the production of a useful electric light, or the subdivision of an electric current into a few lights; the difference, in fact, being the difference between producing an electric light and a system of electric lighting.

The typical Edison "system" is the lighting of a square mile of town area from a central station by means of mains radiating from that centre and so connected with branches and cross-lines that the whole of the network of circuit wires is, so to speak, permeated by electricity, in a way that over the whole area an equal supply of current for all the lights is obtainable. Each "system" is composed of twelve "units," and each unit is supplied by an Edison generator, consisting of engine and dynamo machine combined upon one bed-plate, and capable of maintaining a thousand lights of 16-candle power each—the corresponding light to the ordinary gas jet. Mr. Edison elected to follow this mode of supplying small incandescent lights, because he considered that the public did not commonly want more light for ordinary purposes; and because, also, he believes there should be a more equable distribution of illumination by a number of small lights than by one or a few large ones. In adopting the incandescent form of electric light he contends that, contrary to the arc system, it is not less, but more efficient in proportion as it is applied on larger and larger scales. He assumes that for a system of electric lighting to be safely and widely adopted by the public there must be certain specific conditions to be complied with. Each light must be independent of others, and must be a convenient unit of small candle-power. Each consumer must have absolute control of the lights on his premises; and the engineer at the central station must know at each instant the state of every lamp on his circuit and be able to govern them all.

Mr. Edison starts, then, with a convenient unit for his light—namely, 16 candles. In practice there may be two "half lights" of 8-candle power each; or there may be "double lights" of 32-candle power; but in speaking of the number of lights maintained mention is made as for all being lights of 16-candles. The lamp is a glass bulb, in which is placed a long loop of bamboo fibre, of horse-shoe shape, very fine in section and of great electrical resistance, namely, about 220 ohms when cold, and 140 ohms when hot. After exhaustion to a high vacuum the lamp is doubly sealed to maintain that vacuum. The carbon fibre is rendered incandescent by the passage of the electric current through it. The chief feature in this kind of lighting is that every lamp forms a bridge between two mains, one carbon in each lamp being connected with the one main, and the other carbon of each lamp with the other main conveying the current through the circuit. Every lamp is thus independent of the rest, because if any lamp be broken the current is at once divided amongst the remainder, and any increase in the number of lamps lowers the resistance the current experiences in passing through the lamps from main to main. The armature of the Edison dynamo machine has a very low resistance, and in order to obtain this the bobbin of copper wire employed in other machines has been abandoned, and the core is formed of iron plates, around which is built up a number of copper bars of great thickness. From this it results that the resistance of the dynamo-machine is only a small fraction of the electrical resistance of the lamp. The resistance of the mains is also very small, and accordingly the obstacle to the passage of electricity across from one main to the other is almost wholly concentrated in the lamps. By this arrangement in cases of lamps being added or withdrawn, as the electrical resistance to the current is decreased or increased, a corresponding influence is exerted upon the engine and machines. It will readily be perceived thus that the greater the number of lights upon a circuit the larger is the number which can be turned on or turned off without affecting the rest. In private establishments there would be various numbers of electric lights placed as gas jets are in positions convenient for use; but of these many would be only occasionally employed. An electric current meter therefore is desirable in order that consumers may pay for what only they have consumed. Now, it is known that 1000 cubic feet of gas gives, roughly, 3000 candles' light. Mr. Edison takes that quantity of electricity which, passed through the lamps, gives that amount of light, and he calls it arbitrarily 1000 units; and the electricity used is therefore measured in "thousandths." In order to reckon the quantity used, the current is passed through a "meter," consisting of two zinc plates immersed in a solution of sulphate of zinc on the one part, and a copper coil on the other part; and on the principle of electrolysis, one zinc plate diminishes in weight and the other increases in weight. The increase in weight is deemed exactly proportional to the quantity of electricity which has flowed through, and in order to reckon the quantity chargeable to the consumer the zinc plates are at intervals weighed and the means between the loss of one plate and the gain of the other accurately taken.

By the use of currents of low electric pressure and the interposition of the lamps between the mains, anything like serious danger to persons handling exposed parts of the electric circuit is avoided; for the tension of the current being only 110 volts, and the resistance of the human body very great—several thousand ohms—whilst the resistance of the lamp circuit is very small, only an insignificant portion of the current can traverse the body even if the bare hands are placed on the principal conductors.

The adaptability of the incandescent bulb-lights to ordinary fittings has been abundantly shown, and we need not dwell on that point, after the variety of ingenious brackets and electroliers which have been produced by the former makers of gas fittings.

As to certainty of operation in the supply of electricity, each dynamo is provided with a switch by which it can be cut out of circuit or put into circuit. The breakdown of a dynamo-machine in any installation can thus be very quickly provided for. In every installation the dynamos would be driven in groups by separate engines, and by proper counter-shafts and belts it would be easy, in the case of the breakdown of the engine, to drive any group by the other engine power, or when the engine and dynamo constitute one combined machine the electric current from one could be shunted by conducting wires from one set of feeders to others. Not ordinary accident would thus be the cause of any general extinction of lights.

Having seen thus how the Edison system vindicates itself upon all its points, we have to deal with what has actually been done in that installation which has given rise especially to the present article. The area now lighted—that of the Holborn-viaduct, from Newgate-street to Holborn-circus, represents one "unit" or one-twelfth of a square-mile system; it being understood that the working plant is based upon the circumstances and conditions existing in New York City. The Central Station is at the Edison Company's offices, at No. 57, and thence the mains and branches are carried in protecting pipes under ground to ninety street lamps, the four entrances to the London, Chatham, and Dover Railway Station, the front portions of two large hotels, and to the lights of about twenty shops. In this total of lights there are several sections, each of which can be turned on or off from the central station. The appearance of these ninety street lamps for the past few nights has been a little unintelligible, for the ordinary gas jet was kept burning between two Edison lights. The reason of the lighted gas jet was that the Company, intending to show the cutting off of the sections of light on the occasion of their inaugural entertainment, made this provision against any portion of the street being left in momentary darkness. Hereafter the incandescent lamps will do their own work, and the gas jets will be extinguished. The reason of there being two incandescent lights in each street lamp is that the City authorities do not permit the taking down of the gas service; and consequently as one incandescent light cannot be put in the centre with its proper reflector, one electric light without any reflector has had to be put on each side of the gas burner, which occupies the central position. The power of each of these electric lights is 32 candles, consequently each street lamp gives out an illumination of 64 candles. A comparison of these street lamps, however, with the single 32-candle power lamps at the entrances to the railway station will show that if single Edison lights of this power could have been put properly and centrally in the street lamps, the illuminating power would have been nearly or quite as good as it is at present. The service of electricity is provided for in the Central Station by two Edison 1000-light machines, with steam-engine and dynamo combined. The piston-rod of the engine works direct upon the shaft of the armature of the dynamo machine, and runs at the rate of 350 revolutions per minute. The power developed by the steam-engine in ordinary working is 125 h.p., but it can be raised to 200 h.p. The strength of the electric current is 850 ampères but notwithstanding this enormous force the two great copper conductors can be handled by both hands without the slightest inconvenience or perception of anything at all approaching to a shock. Only one of these huge generating machines is employed for the service of the lighting, the second engine being held in reserve. In a full installation of a "system" there would of course be twelve engines, and no spare one, as the twelve would always have reserve of power enough in themselves to supply the break down of any one of the set. The total lights now maintained on Holborn Viaduct, we believe, is over 1200; and the general condition of the incandescence in these lamps is excellent.

It is understood that the present installation will be made to give exact details of cost of plant, maintenance of lighting service, and all other details, necessary to enable an absolute comparison of the actual cost of the Edison system to be made in regard to the comparative lighting of the same district by gas. In two months a report to this end is to be made by Dr. Hopkinson and Dr. Fleming, and published to the world.

Standard april 13.

THE EDISON ELECTRIC LIGHT.

After some experimental trials during the last few weeks to assure the smooth and perfect working of every part of the arrangements, a demonstration of Mr. Edison's system of lighting the buildings and streets of a district may now be seen in London. From Newgate-street westward, across the Holborn Viaduct, to Hatton-garden, the street and most of the buildings on either side of the street are now, and for the next two months, will continue to be lit by Edison incandescent lamps. For the purpose of street lighting two of the incandescent lamps of 32 candle-power each have been placed in every lamp-post in this section, and it had been hoped that last night permission would have been obtained from Colonel Heywood for the gas to be turned out in order that the effectiveness of the Edison incandescent lamps for street illumination might be proved the more satisfactorily. Application will be made to-day with this view, and it is hoped that to-night the public will have an opportunity of judging on the matter for themselves. Those who can obtain permission to see the machinery and appliances by which the electricity is generated and distributed will find a satisfactory answer to the question which has often been asked during the last four or five years—What is Mr. Edison doing? At his laboratory in Menlo-park, where his experiments have been made, a staff of some 200 assistants has been continuously engaged in carrying out investigations on various subjects suggested for inquiry by the inventor, whose object has been, not merely to demonstrate a scientific possibility of providing a beautiful light, but to devise a practicable and economical system of supplying electricity to the inhabitants of a town from various centres, just as at present gas and water are supplied by public companies. To this end districts of New York and other towns have been canvassed and statistics carefully collected and tabulated, and, to give an instance of the nicety of the adjustment of results to cost, the greater or less thickness of the conductors would vary with the price of coal in different districts, the calculations being based on the consideration that although by increasing the sectional area of the rod the waste of electricity would be diminished, there is a point beyond which it would not be really economical to increase its size on account of the greater cost of the copper. Where, as in the north of England, coal is much cheaper than in London smaller conductors would be used. One of Mr. Edison's objects in making this trial of his system in Holborn is, indeed, to obtain such further and exact information on the requirements of a given district in London as may enable a company adopting his system to make their contracts with the businesslike certainty of results. For the first time in the history of electric lighting, he would claim, there is here perfected a system of electrical supply, consisting of means for manufacturing, regulating, distributing, and measuring electricity by meters for purposes of general consumption by all the inhabitants of a town, and not by a few individuals, whether for lighting, for driving machinery, supplying electric bells, working telephones, or for any other purpose to which electricity is now or may hereafter be put. First, as to the manufacture. There is in the basement of the premises of the Edison Electric Light Company (Limited), No. 57, Holborn-viaduct, the large dynamo-machine, by which all the lights in the district, nearly 1,000 in number, are supplied. It is called a thousand light machine, but is capable of supplying more. That is to say, as with the machines at the Crystal Palace, Mr. Edison prefers that, as a matter of economy, the machines shall be worked considerably below their power. One noticeable point in the system is its safety. The electric pressure, to borrow a term from the system of gas distributors, is so low that a child may hold the electrodes without danger; and with regard to the safety of the lamp, a handkerchief being placed over one of the globes and the glass being shattered, the instaneous extinguishing of the light by the destruction of the vacuum is all that happens. The handkerchief is not even singed. The dynamo-machine is worked by a Porter-Allen high-pressure engine of 150 horse-power indicated, causing the armature to make 350 revolutions per minute. Generator and steam-engine are firmly fastened together on the same cast-iron bed-plate, the engine driving the armature, which is mounted on the crank shaft, directly and without the use of belting. Steadiness of speed is further insured by a sensitive governor, and as lights in a circuit are turned out, say when a theatre performance or a church service is over, the safety of the lamps remaining alight is provided for by a resistance regulator under the care of a man in the photometer and dynamometer room, the engineer proportionately diminishing the work of the engine. The armature is kept cool by a small blowing fan, driven by the engine. The method by which Mr. Edison effects the practically equable distribution of electric force throughout a district is one of the most important features of his system. The principle is explained on the premises of the company by an arrangement of wires stretched on a partition wall and presenting the appearance of a large check pattern, with four distributing stations fed from a central station, the mains being supplied from these stations by conductors placed at regulated distances apart. Small plugs, each containing a piece of lead wire, which will fuse and break contact should the current become too strong, serve automatically to protect the carbon filaments in the lamps from any sudden and accidental rush of electricity to one point in the system. The conducting mains are copper rods insulated in prepared wood and enclosed in iron tubes to prevent leakage. Another remarkably ingenious piece of apparatus is the meter for measuring the quantity of electricity consumed by each customer. This is a bottle containing two plates of zinc in a solution of zinc sulphate, the current in passing causing the one plate to increase in weight at the expense of the other. As, however, if the whole current passed through the bottle this change would go on too rapidly, a properly-proportioned shunt wire allows just 1-870th of the electricity going into the house main to pass through the meter. The estimate of the quantity consumed is made once a quarter, or as often as may be convenient, by weighing the plates in the bottle, a second bottle being supplied, the plates of which the consumer may weigh for himself as a check upon the company. The installation of the system on the Holborn-viaduct has been made by Mr. Edison's representative, Mr. E. H. Johnson, assisted by Mr. Hammer. Mr. Johnson will now return to the United States and leave the control of the working plant to Mr. Arnold White, the manager, and Dr. John Hopkinson and Dr. J. A. Fleming, the electricians of the English Edison Electric Light Company (Limited).

The district lighted is supplied by four circuits. In the first circuit there are 66 street lights and 78 lights, of 16-candle power each distributed in 11 buildings; in the second circuit, 40 street lights and 49 lights in seven buildings; in the third circuit, 24 street lights, 26 lights in the Imperial Hotel, six in a shop, 68 in Messrs. Spiers and Pond's Hotel, of which 20 are in the restaurant, nine in front of the London, Chatham, and Dover Railway station, and 52 in six warehouses; and in the fourth circuit 31 street lamps, 147 16-candle and 14 8-candle lamps in the City Temple, seven 16-candle and four 8-candle lamps at No. 31, 216 16-candle and 10 8-candle lamps in the company's central station, and nine 16-candle and 22 8-candle lamps in the Viaduct Tavern. In this circuit also will be placed 50 16-candle lamps, which are to be tried in the General Post Office.

Times April 13.

ISSUES OF ELECTRIC LIGHT COMPANIES.

It is intended to make this Table most complete, and to give all particulars of the issues. Secretaries of Electric Companies are requested to send further particulars, or to correct errors.

Issued.	Company.	Capital.	Issue.	System.
		£	£	
1878	British Electric Light Co.	100,000	..	Gramme Machine
1880				
Oct.	Electric and Magnetic Co.	500,000	250,000	Jablochkoff
Dec.	Siemens & Co.	..	400,000	Siemen's
Dec.	Anglo-American "Brush" Electric Light Corporation	800,000	400,000	Brush and Lane Fox Incandescent
1881				
Feb.	Swan Electric Light Co.	100,000	..	Swan Incandescent
April	Electric Light and Power Generator Co...	172,500	172,500	Weston and Maxim
July	Eastern Electric Light and Power Co.....	250,000	150,000	Brush, Lane-Fox, India
1882				
Jan.	Electric Light Construction, Supply and Maintenance Co.	500,000	..	
Jan.	Hammond Electric Light, and Power Supply Co.	250,000	125,000	Brush, Lane-Fox, twelve counties in England, and Westminster
Feb.	Faure Electric Accumulator Co.....	1,000,000	500,000	Faure Accumulator
Mar.	Edison Electric Light Co.....	1,000,000	Privately subscribed	Edison Incandescent
Mar.	Electrical Power Storage Co.	800,000	800,000	Sellon-Volckmar Accumulator
Mar.	Electric Lighting Contract and Maintenance Co.	2,003,000	1,003,000	Independent
Mar.	Great Western Electric Light & Power Co.	250,000	125,000	Brush, Lane-Fox, thirteen counties England and Wales
Apri	"Brush" Electric Light and Power Co. of Scotland	300,000	150,000	Brush, Lane-Fox, for whole of Scotland
May	Gülcher Electric Light and Power Co.....	300,000	300,000	Gülcher, United Kingdom
May	South Eastern "Brush" Electric Light and Power Co.	100,000	100,000	Brush, Lane-Fox, for Surrey, Kent, and Essex
May	Indian and Oriental Electrical Storage and Works Co.	400,000	200,000	Sillon Volckmar, in India, Ceylon, Straits Settlements, Egypt, & Malta
May	"Brush" Midland Electric Light and Power Co.	250,000	125,000	Brush and Lane-Fox, for fourteen English and Welsh counties
May	London and Provincial Electric Lighting and Power Generating Co.	250,000	125,000	Chertemps Arc Lamp, Gramme Machines
May	Provincial "Brush" Electric Light and Power Co.	200,000	100,000	Brush and Lane-Fox in eight English counties
May	Australasian Electric Light Power and Storage Co.	225,000	155,000	Brush and Lane-Fox, Australasia and Fiji
May	Devon and Cornwall Electric Light and Power Co.	100,000	100,000	Great Western Electric Company's rights for Devon and Cornwall
May	Electric Carbon Storage and Apparatus Manufacturing Co. of Scotland	150,000	75,000	Electrical Apparatus
May	South African Brush Electric Light and Power Co.	100,000	100,000	Brush, South Africa
May	Metropolitan Brush Electric Light and Power Co.	1,000,000	500,000	Brush and Lane-Fox London & Westminster
May	Pilsen, Joel, and General Electric Light Co.	200,000	200,000	Joel Dynamo, Pilsen, Joel, and Gatehouse, Arc and Incandescent
May	Railway and Electric Appliances Co.	500,000	250,000	Maxim, Scotland
May	Birmingham and Warwickshire Brush....	100,000	100,000	Brush and Lane-Fox, for Warwick, from the Hammond Company
May	Anglo-Pacific Electric Light, Telephone, and Power Co.	300,000	300,000	Brush & Telephone rights, West Coast of South America
May	Phœnix Electric Light and Power Co.....	250,000	125,000	Fitzgerald Incandescent
May	River Plate Telephone & Electric Light Co.	100,000	100,000	Telephone and Electric Argentine Republic & Uruguay
May	Yorkshire Brush Electric Light and Power Co.	300,000	200,000	Brush and Lane-Fox, York, from the Hammond Co.
May	Duplex Electric Light, Power and Storage Co.	100,000	100,000	Duplex
May	Jablochkoff Electric Light and Power Co.	300,000	150,000	"Candle," Maxim Incandescent
May	Great Northern Electric Light Co.	10,000	10,000	Pilsen, Schuckert Machines, North of the Metropolis
May	Swan United Electric Co.	1,000,000	500,000	Swan, Crompton
May	Scottish Pilsen, Joel, and General Electric Co.	200,000	200,000	Pilsen, Joel, Gatehouse, for Scotland
June	Continental Light and Power Corporation	400,000	200,000	Gülcher, for France, Austro-Hungary, Belgium, and Germany
June	W. T. Henley's Electric Light and Power Co.	100,000	100,000	Henley's Patents for United Kingdom and Colonies
June	"Standard" Fyfe-Main Electric Lighting and Construction Co.	500,000	300,000	Fyfe-Main Arc Light, Parent Company
June	Edison's Indian and Colonial Electric Light Co.	250,000	250,000	Edison's Patents for India, Ceylon, Australasia and South Africa
June	Anglo-Spanish Brush Electric Light and Power Co.	200,000	200,000	Brush and Lane-Fox for Spain and its Colonies
June	Anglo-Austrian Brush Electrical Co.....	500,000	300,000	Brush and Lane-Fox for Austro-Hungary
July	"J. B. Rogers" Electric Light and Power Co.	510,000	260,000	Rogers Light and Plant
July	Electric "Sun" Lamp and Power Co.	200,000	200,000	"Sun" Lamp, Clerk's Patents
Aug.	Brush Electric Light Co. of Ireland.....	250,000	250,000	Brush and Lane-Fox for Ireland
		13,650,500	9,850,500	

At Biella, in Italy, several industrial establishments are now lighted by electricity. Swan and Maxim lamps are used. A woollen manufactory is illuminated by eight Maxim lamps. It is stated that the shades of color can be distinguished very well by the electric light.

The Brush Light in America.—The "Brush" company has contracted for 5 years for the lighting of the towns of Rock Island, (Illinois), and several towns of Wisconsin. Electric towers will be used, which will be ready in three months. Sixty lamps are now being worked at Springfield, a town in Massachusetts, well known for its manufactories of arms.

The Paris Telephone Company.—The position of the above company is most satisfactory in every respect. The number of subscribers is constantly increasing: it is sufficient, in order to convince one's self of the development of the company, to throw a glance on the list of new subscribers published each month by the company. The total number of subscribers, for Paris only, now amounts to about 2,400, whereas during the corresponding period last year there were scarcely 1,600 subscribers. And it is worthy of notice, moreover, that the progression follows the geometrical law, which is easily comprehensible considering the manner in which the vulgarisation has to take place. We express but one regret, and that is that the public is not yet admitted to correspond in the district offices, on payment, of course, of a fixed sum. We have ground to believe, however, that the company has done in this respect all that it possibly could, and that the French Postmaster General alone is to blame if this progress has not yet been realized. Although this does not tally with M. Cochery's recent declarations, it is our duty, nevertheless, to call attention to the fact.—We may further add, on trustworthy authority, that, besides the proceeds of its subscriptions, both in Paris and in the country, the company has realized unexpected profits in the manufacture of telegraphic apparatus and cables. It would be premature to set forth any figure in this respect, but we may state that the shareholders will have good cause to be surprised and to congratulate themselves on the profits realized this year.—*Paris Bourse.*

A copy of rules for the erection of lightning conductors, based upon the recently-published report of the Lightning Rod Conference, has been issued by the Explosives Department of the Home Office to the occupiers of all factories and magazines for explosives, and to those local and police authorities upon whom devolves the inspection of stores of explosives.

The Eastern Telegraph Company notify that telegrams are being received at present from Cairo very irregularly, several days' messages having accumulated and apparently got out of order, causing delay in some cases of three and four days. The Egyptian Government announce that they are ready to transmit international telegrams to all stations in Egypt; but, in face of the irregularites referred to, the Eastern Company will accept messages only at senders' risk.

Anglo-American Telegraph Company.—The managing director informs us that the Telegraph Construction and Maintenance Company, with their s.s. "Scotia," have succeeded in picking up the Anglo-American Telegraph Company's cable, laid in 1869, between Brest and St. Pierre, in mid ocean, in depths varying from 1,600 ot 1,930 fathoms of water, and repairing the fault which occurred on the 18th March last. They have also repaired a minor fault at a distance of 335 miles from Brest, in a depth of 1,260 fathoms. The whole of the company's system of cables and land lines is now in perfect working order and condition.

Direct Spanish Telegraph Company.—The report states that it is proposed to declare a dividend of 8s. per share, and to add £800 to the reserve fund.

The Electric Light in Berlin.—A Reuter's telegram from Berlin says:—The first introduction of the electric light for the streets of Berlin was made last evening in one of the chief thoroughfares, the Leipziger Strasse. The process adopted is that of the Siemens-Halske differential lamp.

THE LEATHER TRADES' EXHIBITION AT THE AGRICULTURAL HALL.

Mr. Thomas Telbutt, wholesale shoe manufacturer both for home and colonial markets, of King Street, Northampton, shows at Stand 56 a selection of his excellent articles. Amongst these special attention is due to a speciality manufactured by this firm, which has already won golden opinions from all those under whose notice it has come. This is the Patent Magnetod Boot, manufactured under Whiting's patent. It may be stated that Magnetod Boots prevent and cure many of the diseases of the feet. Not only have medical authorities expressed their opinion that great things are to be done by the use of the Magnetod for chronic rheumatism and rheumatic gout, but several influential physicians recommend them warmly in cases of incipient paralysis, cramp, &c. It is claimed for these boots that soreness or swelling of feet, cold feet, chilblains, or other diseases of the feet are by them prevented or cured. Members of the Royal Family have worn and highly approved of them, and we have much pleasure in recommending them to the many thousands who are suffering from these complaints. What martyrdom will be prevented by them is known only to those who have continually to bear such an infliction. To sportsmen, farmers, seafaring men, gardeners, and miners they may be particularly recommended, as also to grocers' and drapers' assistants, and to all others who are constantly on their feet or to those who [illegible]

Exhibit (E)

57, HOLBORN VIADUCT,

SUNDAY, APRIL 4, 1882.

THOMAS A. EDISON ESQ.,

65, FIFTH AVENUE, N. Y.

MY DEAR EDISON,

YOUR AUTOGRAPH ON ADJUSTMENT OF BRUSHES AT HAND. WE HAVE NOT HAD ANY RESISTANCE IN THE FIELDS OF THE BIG DYNAMOS AT ALL; WE HAVE BEEN REGULATING ENTIRELY BY THE STEAM. EVER SINCE THE FIRST NIGHT OR TWO, WHEN THE NEW MACHINE GAVE US CONSIDERABLE TROUBLE, WE HAVE BEEN WORKING THE BRUSHES AT A DIFFERENT ANGLE FROM THAT WHICH THEY HAD WHEN WE RECEIVED THEM, AND THIS WAS DONE IN ORDER TO ENABLE US TO ADJUST THEM TO THE VERY POSITION THAT YOU NOW DIRECT. IF YOU WILL THINK BACKWARDS TO ONE OF MY EARLY LET--TERS, YOU WILL RECOLLECT THE FACT THAT I THEREIN TOLD YOU THAT THE DIFFICULTY WAS OWING TO HAMMER HAVING THE BRUSHES ON TOO STRAIGHT, AND THAT WE SET THEM MORE OBLIQUELY, AFTER WHICH THE TROUBLE DISAPPEARED. THE FACT IS, THAT WE HAVE HAD NO TROUBLE WHATEVER WITH SPARKING, EXCEPT THAT THERE WAS SOMETHING WRONG WITH THE MACHINE I.E., WHEN THE COMMUTATOR GOT CROSSED AND SUBSEQUENTLY WHEN THE LUG CONNECTIONS GOT LOOSE. THESE TWO DEFECTS HAVING BEEN PERMANENTLY REMEDIED, WEHAVE NOW NO TROUBLE WHATEVER AND THE MACHINE IS RUNNING BEAUTIFULLY. THERE IS SCARCELY ANY SPARKING WITH 700 TO 800 LAMPS, AND WE ARE USING LESS AND LESS COAL ALL THE TIME; THE ENTIRE APPARATUS, INFACT, GAINS IN ECONOMY. YOU CAN DRAW A GREAT MANY INTERESTING FACTS OUT OF HOOD, BY CROSS-QUESTION-ING HIM, (I PRESUME YOU KNOW YOU WILL NOT GET MUCH FROM HIM UN-LESS YOU DO PURSUE THIS COURSE). NOTWITHSTANDING THE ABOVE FACTS

I AM NONE THE LESS PLEASED TO RECEIVE YOUR LETTER AND HAVE FRAMED IT, GILT-EDGED, AS AN EVIDENCE THAT YOU DO SOMETIMES WRITE AUTOGRAPHICALLY.

WE ARE NOW DISCUSSING THE QUESTION OF ERECTING ANOTHER BOILER AND ANOTHER STEAM-DYNAMO ON THE VIADUCT, FOR THE PURPOSE OF SECURING ADDITIONAL RELIABILITY AND OF PUTTING OUT ANOTHER 1000 LIGHTS, IN ORDER TO OBTAIN HIGHER ECONOMY. OUR SHAFT, WHICH COST NEARLY £600, OUR RESERVE DYNAMO, £2,000, THE RENT OF THE ESTABLISH--MENT, LABOUR, AND VARIOUS OTHER THINGS NOW CHARGED TO THE PRODUCT ON ONE MACHINE, WILL THEN BE CHARGEABLE TO THAT OF TWO, AND WILL THUS GREATLY INCREASE OUR ECONOMICAL SHOWING, BESIDES WHICH, WE SHALL BE ABLE TO MAKE A MUCH LARGER DISPLAY AND TO SECURE GREATER RELIA--BILITY. IT IS NOT CONTEMPLATED TO MAKE OF THIS A PERMANENT STA--TION, OR TO FURTHER INCREASE THE PLANT BEYOND THIS ADDITIONAL MA--CHINE, BUT IT IS CONSIDERED WISE (AT LEAST, IT IS MY PROPOSITION' AND IS ASSENTED TO BY THE BOARD) TO MAKE THIS ADDITION, IN ORDER TO EFFECT AN ADVANTAGEOUS OPERATION AND SHOWING IN RESPECT OF THIS FIRST INSTALLATION. A LARGER INSTALLATION WILL SHORTLY BE ESTABLISHED, MORE NEARLY IN THE CENTRE OF THE CITY PROPER ; BUT MY IDEA IS, THAT IT WILL NEVER DO IN THE GENERAL INTEREST, TO PERMIT THIS VIADUCT INSTALLATION TO BE DISCONTINUED, AND THAT, SINCE IT IS IS TO BE CONTINUED UNTIL A LARGER STATION CAN BE PUT INTO OPERATION AND SINCE THAT CANNOT BE EFFECTED WITHIN A YEAR - AND SINCE ALSO, THE GREAT QUESTION OF COST WILL BE determined BY THE WORK DONE HERE, I AM OF THE OPINION THAT THE PROPOSED ADDITION IS FULLY JUSTIFIED BY THE ENDS SOUGHT. AS IT IS, WE WILL EVEN NOW BE ABLE TO SHOW THE COST TO BE WITHIN THE COST OF GAS, OR TO CLOSELY APPROXIMATE. THERETO. BY SLIGHTLY INCREASING THE ECONOMY, I AM SATISFIED THAT I CAN MAKE THE VIADUCT STATION SHOW AN ACTUAL PROFIT - TAKING THE

PRICE CHARGED FOR GAS - AND AFTER TAKING INTO ACCOUNT EVERY ITEM THAT CAN POSSIBLY BE CHARGED TO THE PRODUCTION OF THE LIGHT.

THE 260 OHM LAMPS HAVE BEEN FOUND, AND WILL BE TESTED BY THE CRYSTAL PALACE JURY. I AM ALSO PUTTING IN ONE OF YOUR 250 LIGHT DYNAMOS FOR TESTING. I HOPE, ON THESE TWO LATER ARRIVALS TO BE ABLE TO OBTAIN A VERY FAVOURABLE REPORT. I LIKE THE NEW LAMP VERY MUCH - I HAVE ONE IN MY 5-LIGHT CHANDELIER AT THE PRES--ENT MOMENT, AND AM HARDLY ABLE TO DISTINGUSH BETWEEN IT AND THE A LAMPS. SIR WILLIAM THOMPSON, WHO HAS ALL ALONG PROTESTED THAT SWAN WAS IN ADVANCE OF YOU IN RESPECT TO THE LAMP, AS CONSIDERED BY ITSELF, REMARKED TO ME A FEW DAYS AGO - UPON MY TELLING HIM THAT I HAD RECEIVED A CASK OF LAMPS 260 OHM HOT - 10-CANDLES ''THAT IS A VERY GREAT STRIDE INDEED.''

WE COMMENCED ON THE 1ST. JUNE, THE ACCURATE ECONOMY TEST ON THE VIADUCT. I LEAVE HERE ON THE 17TH., AND WILL THEREFORE NOT BE ABLE TO BRING WITH ME THE 30 DAYS' RECORD, BUT WILL DO SO IN RESPECT OF THE FIRST 15 DAYS, FROM WHICH YOU CAN MAKE YOUR OWN CALCULATIONS. ON THE 1ST. JULY, WE SHALL BEGIN TO CHARGE FOR THE LIGHT, BY WHICH TIME I SINCERELY HOPE THAT YOU WILL BE ABLE TO FUR--NISH US WITH EITHER 50, OR 100, STREET CANDLE LAMPS. MY PRIVATE OPINION IS, THAT THE 50-CANDLE LAMP WILL ULTIMATELY BE ADOPTED FOR STREET LIGHTING, EVEN THOUGH THE 100 CANDLE LAMP SHOULD BE FORTH-COMING AND PROVE SATISFACTORY, AS I DO NOT BELIEVE THE CITY AU--THORITIES WILL CARE TO PAY FOR MORE THAN 50 CANDLES, WHICH IS QUITE SUFFICIENT - SEEING THAT THE LAMP POSTS ARE PLACED SO CLOSE TOGETHER, TO GIVE A SUFFICIENTLY BRILLIANT LIGHT FOR THE PURPOSE.

LAST WEEK WE ~~POUND~~ FINALLY CONCLUDED THE NEGOTIATIONS FOR THE S.E. AND S.W. AND THE WESTERN DISTRICTS OF LONDON. THE CONSOLIDATED TELEPHONE CONSTRUCTION & MAINTENANCE CO., AND CLARK,

MUIRHEAD & CO., ARE THE PARTIES MAKING THE PURCHASE, AND THEY JOINTLY PAY US FOR THESE THREE DISTRICTS, £75,000 AND HALF PROFITS. WE HAVE THEREFORE BROUGHT TWO OF OUR DISTRICT ORGANIZATIONS TO A FINAL CONCLUSION, VIZ;- THESE DISTRICTS AND LANCASHIRE. OUR CASH REVENUE FROM THESE TWO ORGAINZATIONS IS £125,000. NEGOTIATIONS FOR OTHER DISTRICTS ARE IN MORE OR LESS FORWARD STATE. GOUREAUD'S COLONIAL AFFAIR MOVES VERY SLOWLY. I HAD A LONG SESSION WITH THE PARTIES YESTERDAY, AND I THINK THE SMALL DIFFERENCES ABOUT WHICH THEY HAVE BEEN QUIBBLING FOR SOME TIME, ARE ALL NOW REMOV--ED. THE CASH PAYMENT WILL BE £25,000, AND A LIKE AMOUNT IN F ULLY PAID A SHARES. IT IS EXPECTED, OF COURSE, THAT THESE SHARES WILL IMMEDIATELY GO TO A PREMIUM, IN WHICH EVENT WE WILL SELL THEM, AND THUS BE ABLE TO TRANSMIT TO YOU THE £50,000 ORIGINALLY CONTEMPLATE AS THE PURCHASE MONEY FOR INDIA & AUSTRALIA

CRYSTAL PALACE EXHIBITION CLOSED LAST NIGHT. WE WILL IMMEDIATELY BEGIN PACKING ALL THE EXHIBITS, OTHER THAN THOSE PER--TAINING TO ELECTRIC LIGHT, AND RETURN THEM TO YOU, ADDRESSED ''MENLO PARK'' I HAVE YOUR COMMUNICATION ABOUT THE CONSULAR CER--TIFICATES, AND WILL ATTEND TO IT, SO THAT THERE WILL BE NO DUTY CHARGED UPON THEM.

WE HAVE SENT 5 OF YOUR PATENTS INTO COURT, FOR DISCLAIMER AND HOPE TO GET THE DISCLAIMERS ALLOWED BEFORE THE LONG VACATION, AND THUS BE PREPARED FOR THE GREAT CONTEST WHICH WE PROPOSE TO INAUGURATE WITHOUT DELAY. THE RAOD HAS BEEN PRETTY WELL CLEARED AND I AM SATISFIED THAT ALL THAT IT IS POSSIBLE TO DO HAS BEEN DONE TO MAKE THE CONTEST A STRONG ONE. THE ENTIRE THEORY OF YOUR SYSTEM, BOTH IN GENERAL AND IN DETAIL, IS NOW UNDERSTOOD, AS IT WAS NOT UNDERSTOOD AT FIRST, AND I THINK YOU MAY PLACE ENTIRECON--FIDENCE IN THE ABILITY OF THE MEN IN WHOSE HANDS THE MATTER IS AT

PRESENT PLACED, TO BRING THE THING TO A SUCCESSFUL ISSUE. MEANTIME, NEGOTIATIONS OF A MORE OR LESS INDIRECT CHARACTER MAY BE OPENED WITH SWAN'S, BUT ON ONE GROUND ONLY; VIZ;- A COMPLETE RECOGNITION OF THE VALIDITY OF YOUR PATENT ON THE LAMP. VERY LITTLE, HOWEVER, HAS BEEN DONE IN THIS DIRECTION AS YET; IN FACT, NOTHING BEYOND THE PUBLICATION OF A CARD BY OUR SOLICITORS, ON THE OCCASION OF THE LAUNCHING OF THE NEW SWAN'S CO., TO THE EFFECT THAT THE SWAN'S LAMP WAS AN INFRINGEMENT OF OURS, AND ALSO OCCASIONAL INTERVIEWS WHICH MR. WATERHOUSE HAS WITH THE SOLICITOR TO THE SWAN'S CO., WITH WHOM HE IS PERSONALLY ACQUAINTED, IN WHICH BOTH PARTIES EXPRESS A HOPE THAT MATTERS MAY BE SO ARRANGED THAT A LEGAL CONTEST WILL BE AVOIDED. YOU NEED NOT, HOWEVER, FEAR ANYTHING LIKE AN AMALGAMATION OF THE TWO INTERESTS - THAT WILL NOT BE DONE.

I WROTE YOU SOME TIME SINCE ABOUT SELLING YOUR ORIENTAL TELEPHONE SHARES; YOU NEED NOT TROUBLE YOURSELF ABOUTIT, AS I HAVE BEEN WHOLLY UNABLE TO GET A QUOTATION FOR THEM AT ANY PRICE.

WATERHOUSE HAS WRITTEN TO LOWRY, OR FABBRI ABOUT THE DIVISION OF THE B SHARES OF THE ELECTRIC LIGHT CO., I HOPE IT WILL BE SO ARRANGED THAT I WILL BE ABLE TO GET SOME OF MINE BEFORE I LEAVE HERE, AS I DESIRE TO SELL A FEW, THOUGH NOT MANY. I HAVE BEEN OFFERED £10,000 FOR MY 500 A SHARES, BUT BY THE ADVICE OF SIR JOHN LUBBOCK AND OTHERS, I HAVE DECLINED IT. I WANT TO KEEP THEM, AND WOULD PREFER TO SELL THE B SHARES. I AM ARRANGING BEFORE LEAVING, THAT WHITE SHALL CONDUCT ANY TRANSACTIONS IN THESE SHARES FOR YOU AND I, THAT WE MAY HEREAFTER DESIRE.

VERY TRULY YOURS,

Edwd. H. Johnson

E.L. — Foreign — Australia

April 5, 1882

To all to whom these Presents shall come I Thomas Alva Edison of Menlo Park in the State of New Jersey United States of America Send Greeting Whereas I am the Owner of Letters Patent or Letters of Registration granted to me in the following British Colonies to wit, Victoria, New South Wales, Queensland, and New Zealand for certain inventions relating to the production distribution and working of the Electric light being the Letters Patent specified in Schedule A. hereto and have also made the applications for other Letters Patent or Letters of Registration in the said Colonies for inventions of the like character which are specified in Schedule B. hereto Now I the said Thomas Alva Edison have made constituted and appointed and DO hereby make constitute and appoint Edward Hibert Johnson now residing at 57 Holborn Viaduct London my true and lawful Attorney for me and in my name place and stead to negociate with any person or persons for the sale and disposition of and to sell and dispose of for any sum of money or other consideration and on any terms and subject to such stipulations and conditions as he may think fit all my right title and interest in and to all and every of the said Letters Patent or Letters of Registration specified in the said Schedule A and in and to all the said applications for Letters Patent or Letters of Registration specified in Schedule B. and in and to all and every of the Letters Patent or Letters of Registration to be granted in pursuance thereof and all my right title interest right of use or sale benefit and enjoyment in every

respect in and for the said Colonies respectively of the inventions improvements devices and apparatus described in and protected by such Letters Patent or Letters of Registration already granted or to be granted or of such applications as aforesaid and of all improvements hereafter to be made therein and Letters Patent or Letters of Registration hereafter to be granted in respect thereof And all such right title or interest as I may have as Inventor or otherwise to receive grants of Letters Patent or Letters of Registration by or for the Colonies of West Australia South Australia and Tasmania for all and every the said inventions described in any of the Letters Patent or Letters of Registration or applications therefore specified in Schedules A and B hereto and all improvements hereafter to be made therein and all Letters Patent or Letters of Registration hereafter granted in respect thereof And to this end for me and in my name place and stead to enter into approve of and sign such formal Agreement or Agreements as may be necessary which formal Agreement or Agreements may contain all such provisions as to my said Attorney or his substitute or substitutes shall seem proper including a power to refer disputes between me and the Purchaser or Purchasers to arbitration And for me and in my name place and stead to sign seal execute acknowledge deliver and do in England or in all or any of the said Colonies according to the laws for the time being in force there such deed or deeds instrument or instruments and notarial acts or deeds as the said Edward Kilbeard Johnson

my said Attorney or his substitute or substitutes shall deem requisite or expedient for transferring or otherwise effectually assuring the premises to be included in any and every such formal Agreement as aforesaid unto such person or persons as he or they may think fit and also by the same Deed or Deeds instrument or instruments to enter into such covenants as are usual for a Vendor to enter into or may be otherwise reasonably required or be found expedient And also to do and execute such further acts matters and things as the said Edward Hibbered Johnson my Attorney or his substitute or substitutes may deem expedient for recording registering or otherwise completing and giving validity to such Agreement or Agreements deed or deeds notarial act or acts instrument or instruments according to the laws aforesaid And also for me and in my name place and stead and on my behalf to settle and approve of the form of any Licenses under the said Letters Patent or Letters of Registration which it may be stipulated shall be granted to me and to accept delivery of such Licenses and if necessary to enter thereby into any Covenants which to my said Attorney or his substitute or substitutes may seem expedient or proper in connexion with such licenses and to execute sign and deliver such licenses or the Counterpart thereof and to effect and do all such other acts or things including the registration of such Licenses as may be necessary or proper for making the same valid and effectual And I hereby grant full power to the said Edward Hibbered Johnson to substitute and appoint from time to time one

or more Attorney or Attorneys under him the said Edward Hibberd Johnson with the same or more limited powers and such substitute or substitutes at pleasure to remove and another or others to appoint And I hereby for myself my heirs executors and administrators ratify and confirm and agree to ratify and confirm whatsoever my said attorney or any substitute or substitutes acting under him shall do or purport to do by virtue of these presents including in such confirmation whatsoever shall be done between the time of my decease or the revocation by any other means of this Power of Attorney and the time of such decease or revocation becoming known to my said Attorney or his substitute or substitutes And I hereby authorize and empower my said Attorney or his substitute or substitutes to acknowledge in my Name and as my act and deed this power of Attorney and to register and record the same in the proper Office in any of the Colonies aforesaid and to procure to be done any and every other act matter and thing whatsoever which may be in anywise requisite or proper for authenticating and giving full effect to this Power of Attorney according to the laws and usages of the said Colonies or any of them In Witness whereof I the said Thomas Alva Edison have hereunto set my hand and seal this fifth day of April One thousand eight hundred and eighty two.—

Signed sealed & delivered by the above named Thomas Alva Edison in the presence of—
Saml. Insull
C. P. Mott

Thomas Alva Edison (Ls)

Schedule A

(See next Page)

Schedule. A.

List of Patents

No.	Victoria		New South Wales			Queensland		New Zealand
2632	Thermo regulator March 27. 1879		Improvements in electric lamps &c dated March 2. 1880.			Improvements in electric lamps &c dated March 12. 1880	442	Improvements in electric lamps &c. dated May 4. 1880.
2685	Improvement in electric & oxyhydrogen lights &c dated August 16. 1879		Improvements in electric lamps &c dated April 21. 1880.			Improvements in electric lamps &c dated May 3. 1880.	452	Improvements in electric lamps &c dated June 11. 1880.
2780	Improvement in electric lamps &c dated January 30. 1880.		Improvements in electric lamps dated July 26. 1880.			Improvement in electric lamps &c dated August 3. 1880	484	Improvements in electric lamps &c dated October 18. 1880.
2812	Improvement in electric lamps &c dated March 18. 1880		Improvements in utilization of electricity for light heat and power &c dated July 26. 1880.			Improvements in utilization of electricity for light heat and power &c dated August 3. 1880	485	Improvements in utilization of electricity for light heat and power &c. dated October 18. 1880.
2841	Improvements in utilization of electricity for light heat & power dated June 11. 1880		Improvements in dynamo or magneto electric machines &c dated Jan: 19. 1881.			Improvements in dynamo or magneto electric machines &c dated Feb: 7. 1881.	510	Improvements in electric lamps and in carbons &c dated March 7. 1881.
2842	Improvement in electric lamps &c dated June 15. 1880		Improvements in electric lamps and in carbons &c dated April 2. 1881.			Improvements in electric lamps & in carbons &c dated Feb 7. 1881.	511	Improvements in dynamo or magneto electric machines dated March 7. 1881.
2926	Improvements in dynamo or magneto electric machines dated November 17. 1880		Improvements in systems of conductors &c dated March 7. 1881.			Improvements in systems of conductors &c dated March 9. 1881.		Improvements in systems of conductors &c dated March 7. 1881.
2936	Improvements in electric lamps and in carbons &c dated Dec 19. 1880.		Improvements in means of measuring amount of electric current dated March 7. 1881.			Improvements in means for measuring amount of electric current &c dated March 9. 1881	520	Improvement in means for measuring amount of electric current &c dated April 13. 1881.
2944	Improvement in systems of conductors &c dated July 14. 1881.		Improvement in magneto or dynamo electric machines &c dated July 14. 1881.			Improvements in magneto or dynamo electric machines &c dated June 30. 1881	549	Improvements in system of electric lighting in electric lamps &c. dated Sept 15. 1881.
2948	Improvements in means for measuring amount of electric current &c dated July 12. 1881.		Improvement in systems of electric lighting in electric lamps &c dated August 13. 1881.			Improvements in system of electric lighting in electric lamps &c dated August 23. 1881.		

Schedule A. (Continued)

List of Patents

No.	Victoria	New South Wales	Queensland	No.	New Zealand
3012	Improvements in magneto or dynamo electric machines dated May 12. 1881.	Improvements in Vebermeters &c dated August 13. 1881	Improvements in Vebermeters &c dated August 23. 1881	550	Improvements in Vebermeters &c dated Septr. 15. 1881.
3023	Improvements in Vebermeters &c dated June 15. 1881.	Improvements in devices for measuring electric currents dated Septr. 24. 1881.	Improvements in devices for measuring electric current &c dated Octr. 18. 1881.	551	Improvements in magneto or dynamo electric machines dated Septr. 15. 1881.
3024	Improvements in systems of electric lighting in electric lamps &c dated June 15. 1881.	Improvement in electric lights and fittings &c dated Octr. 26. 1881.		568	Improvements in devices for measuring electric currents &c dated 10. November 1881.
3054	Improvements in devices for measuring electric current &c dated August 8. 1881.	Improvements in electric arc lights dated October 26. 1881.			
3076	Improvements in electric lights and fittings &c dated Septr. 6. 1881.	Improvements in electric lamps &c dated November 5. 1881.			
3077	Improvements in electric lamps &c dated Septr. 6. 1881.	Improvements in magneto & dynamo electric machines &c dated Octr. 26. 1881.			
3078	Improvements in magneto and dynamo electric machines &c dated Septr. 6. 1881.	Improvements in magneto and dynamo electric machines &c dated November 5. 1881.			
3079	Improvements in electric arc lights dated Septr. 6. 1881.				
3088	Improvements in magneto & dynamo electric machines &c dated Septr. 20. 1881.				

Schedule B.

Schedule B.

Solicitors Case No.	Applications for Letters Patent for inventions as follows.	Victoria	New South Wales	Queensland	New Zealand
16	Improvements in electric lights and fittings &c	Letters Patent granted as above	Letters Patent granted as above	Application forwarded	Application forwarded
17	" " electric arc lights	" " "	" " "	" "	" "
18	" " electric lamps &c	" " "	" " "	" "	" "
19	" " magneto and dynamo electric machines &c	" " "	" " "	" "	" "
20	" " " " "	" " "	" " "	" "	" "
21	" " commutators &c	Application forwarded	Application forwarded	" "	" "
23	" " dynamo or magneto electric machines	" "	" "	" "	" "
24	" " construction and arrangement of conductors &c	" "	" "	" "	" "
25	" " dynamo or magneto electric machines	" "	" "	" "	" "
26	" " Electric lamps &c	" "	" "	" "	" "
28	" " manufacture of carbon conductors &c	" "	" "	" "	" "
29	" " systems of electric lighting	" "	" "	" "	" "
32	" " Meters &c	" "	" "	" "	" "

United

United States of America
State of New York
City and County of New York

On this fifth day of April 1882 before me personally appeared Thomas Alva Edison to me known and known to me to be the person described in and who executed the foregoing power of Attorney and acknowledged to me that he executed the same for the uses and purposes therein set forth.

In Witness whereof I have hereunto set my hand and official seal at the City of New York this fifth day of April 1882

(Signed) Wm. H. Meadowcroft
Notary Public
New York County.

L.S.

Her Britannic Majesty's Consulate General New York.

I Edward Mortimer Archibald Esq: Companion of the Most Honorable Order of the Bath, Her Britannic Majesty's Consul General for the States of New York, New Jersey, Connecticut, Rhode Island and Delaware

Do hereby Certify that I have

reason to believe that the signature subscribed and Seal affixed to the Certificate hereunto annexed are the true Signature and Seal of Wm H. Meadowcroft who was on the day of the date of said Certificate a Notary Public in and for the State of New York duly commissioned and sworn, to whose official acts faith and credit are due.-

In Witness whereof I do hereunto set my hand and seal of Office at the City of New York this fifth day of April in the year of our Lord one thousand eight hundred and eighty two.

(Signed) E. M. Archibald
H. B. M. Consul Genl.

L.S.

We have examined the above with the original & certify it to be a true copy
25th April 1882

Richard L. Harrison
Wilson Rawdon

Charles Wilmot
Catherine Olivia Lebotheson
1 Mr Court
Lincolns Inn Fields

English Light
White

The Edison Electric Light Company, Limited.

57, Holborn Viaduct,

London, E.C. April 5th 1882

Dear Mr Insull,

I wrote you a few days ago on receiving the favour of a few of your Bulletins, but the letter was left unfinished owing to press of work. It is my desire to conclude a certain arrangement then in progress before Communicating direct with Mr Edison or yourself. I desire to open up personal relations once more with you, because — were perhaps I need not add anything to the "because", because the reasons for so doing are obvious.

As I am writing to Mr Edison & this mail, a letter which I leave open for your perusal, perhaps you will let these few lines form the first of the letters I hope to write to 65 Fifth Avenue when Johnson has returned.

I have done all that I can, with justice to myself to effect a formal ~~reconciliation~~ reconciliation with Gouraud so that we should at least exchange views & the ordinary Civilities of common life. But as he has not even acknowledged my letter, I can go no further in that direction.

The Company is going with a swing. We

The Edison Electric Light Company, Limited.

57, Holborn Viaduct,

London, E.C. ..... 188 ___

effect to get a large sum of money from Lancashire, or, I should say, a portion of Lancashire as Liverpool & the area adjacent is to be excepted from the area to be acquired by the proposed District Compy.

Negotiations are also in progress with good people in Glasgow, Croydon, Bradford (Waugh) Bermondsey, Bristol &c.

Dr. Hopkinson is now committed to the Company, & I think the Scientific department is unrivalled. The Board sits twice a week, & the Directors meet informally every day. You must take this letter as an instalment & if you want more let me know.

I am,
Dear Mr Insull
Yours very truly
Thomas White

S. Insull Esq

English Light

The Edison Electric Light Company, Limited. Apr 5-82 White

57, Holborn Viaduct.

London, E.C. 5th April 1882

Thomas A. Edison Esq
65 Fifth Avenue
New York

My dear Sir,

The receipt of your favour of 22nd March, through Mr Insull, suggests to me an opportunity for addressing you direct on the occasion of my becoming connected with you once more.

I am aware that my character and qualifications have not been represented to you in the most favourable light by our mutual friend the Duke of Norwood.

All I would say on the subject is to ask you to judge of my work in the future in the same spirit as my friends view it in the past. As I am the fortunate possessor of 500 A shares, self interest will assist the efforts I am endeavouring to exert from other considerations.

I should much prize a letter, if only one line, signed by yourself in reply to this communication.

I am,
My dear Sir,
Yours faithfully
Imola White

Insert in Wale – Apr 16. 82

Personal

The Edison Electric Light Company, Limited.

57, Holborn Viaduct,

London, E.C. 6 April 1882

Dear Mr Insull,

Your letter to Mr Johnson on many subjects finds him so busy he has asked me to write you a few lines on the "Domestic Electric Light Company". I am busy too, and so my letter must be short. The D. E. L. Co. is the creation of G. E. G. The articles of association occupy just 2 pages, & the shareholders are 7 clerks & no Directors were named. The Co. has no patents, and no property & as far as I can find out no capital; in fact it was a name or pretext rather. At the same time Gouraud's known connection with Mr Edison gave many people the impression that it was the veritable Edison Coy. & the proof of this was the remark of the Managing Director of St. James

Hall who told me that he thought that he was dealing with the Edison Comp^y when in point of fact he was only in communication with the Domestic Co. who have been engaged in making, or trying to make contracts with owners of public buildings. Johnson had from time to time conversations with Howard, + the true character of the Domestic Co. never appeared until the appearance of the advertisement copy of which I enclose. The names of the Directors of the new Co. are A.1 — at least some of them — but why we should pay a middleman Comp^y when we can ourselves supply the public I fail to see. If they become a district company of ours well & good, but unless this is done we have nothing to gain from a connection with them.

We have a Press Reception on the 11th & have asked 40 Representatives of the London Press & some New York gentlemen. We shall have another reception for the Country press later on.

I expect Johnson will write you on Sunday about this new Company, as I believe that they are not unlikely to make us an offer.

Yours very truly
J. Wolcott Price

S. Insull Esq

6, Lombard Street
April 6th 1882

My dear Edison,

I am very much obliged for the "Bulletins" of the Edison Electric Light Compy which you have sent to me. I should like it if you would kindly send me several copies of each number, as I could make very good use of them among my friends. Please also let me have a few more copies of the little book entitled "The Edison Light".

Yours very truly

W Thomson

English Light

The Edison Electric Light Company, Limited.

Davis

57, Holborn Viaduct.

London, E.C. 8th April 1882

Samuel Insull Esqre

65 Fifth Avenue

New York.

Dear Sir,

Our Secretary (Mr Arnold White) has requested me to write and ask if you will be good enough to send him 100 Copies of the little Book which so ably describes Mr Edison's System of Electric Lighting a few copies of which you have already sent him and for which he requests me to thank you

I am Dear Sir

Yours truly

Geo. Harper

P.S. I enclose cutting from today's Daily News, on second consideration I send you the paper entire

I will forward a number of copies in due course. As you will see Mr. Johnson's popularity gains every day and deservedly so. No man in this world could work more vigorously yet the physical strain upon him has but little effect. He moves about ~~so~~ quickly, especially at the Palace, that if you wish to keep pace with him you must run all the time.

EDISON'S FOREIGN ELECTRIC LIGHT & MOTIVE POWER COMPANY.

DIRECTORS.
COLONEL LAURIAUD, CHAIRMAN
T. A. EDISON ESQ.
C. JOHNSON ESQ.
EDW. H. WINFIELD ESQ. MANAGING DIRECTOR

6, Lombard Street,
London, E.C. 12 April 1882

T. A. Edison Esq
65 Fifth Avenue
New York, U.S.A.

Dear Sir

Mr. Johnson has kindly given us a copy of your "Instructions for the installation of isolated plant" published in November 1881. As we are sending out continually Electrical Engineers with the isolated plants we are now shipping we shall be much obliged if you will send us as many copies as you can spare, in order that all the men working your System may be able to read & have a copy of it.

We beg leave to acknowledge with thanks the certificates of the testing of 17 Dynamos which you were good enough to send us (through your Mr. W. S. Andrews) from your works

I am Dear Sir
Yours Truly
Edw. H. Winfield
Managing Director

English Light

The Edison Electric Light Company, Limited.

White

57, Holborn Viaduct.

London, E.C. April 15th 1882

Thomas A. Edison Esq.
65. Fifth ~~Street~~ Avenue
New York.

Dear Sir,

I beg to confirm the following cables:

"Send Stout & Macdonald arrange passage"

When shall we have the "Regulator for No. 3 Dynamo Rush"

I am, Dear Sir,
Yours truly,
Arnold White
Secretary
per Geo: Hayes

(over)

P.S. In the newspapers mailed today you will observe in the "Times" and "Morning Advertiser" leading articles on the subject of Electric Lighting in which Mr Edison's is the only name mentioned as an Inventor in this line. Mr Johnson is very much pleased at this recognition for which he has been working hard all along.

J.H.

English Light

The Edison Electric Light Company, Limited.

A. White

57, Holborn Viaduct.

London, E.C. APRIL 21ST. 188 2

THOMAS A. EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

WE SHALL FEEL OBLIGED IF YOU WILL SEND US AT YOUR EARLIEST CONVENIENCE A SCHEDULE OF THE PRICES TO US OF THE DIFFERENT SIZED METERS WHICH YOU THINK ARE MOST LIKELY TO BE REQUIRED.

I AM, DEAR SIR,

YOURS FAITHFULLY,

SECRETARY.

Miscellaneous

The Edison Electric Light Company, Limited.

White

57, Holborn Viaduct.

London, E.C. APRIL 21ST. 188 2

SAMUEL INSULL ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR MR. INSULL,

ONE OF OUR SHAREHOLDERS, WHO IS A FRIEND, I BELIEVE, OF MR. FABBRI'S, IS VERY ANXIOUS TO KNOW THE COMMERCIAL STANDING OF THE ELECTRO DYNAMIC COMPANY OF PHILADELPHIA, WHICH IS WORKING THE GRISCOMBE PATENTS. WOULD YOU BE SO KIND AS TO ENQUIRE & LET ME KNOW IN CONFIDENCE THE RESULT.

YOURS VERY TRULY,

21st April 1882

Edison's Electric Light Patents

Copy
Opinion of Mr Shelford Bidwell as to Disclaimers

Apr 21 82
Patents
3

Waterhouse & Winterbotham

Edison's Electric Light Patents.

Opinion as to Disclaimers.

I have very carefully considered the question of the alteration of Mr. Edison's specifications by disclaimer with special reference to the observations and suggestions of Mr. Edison Mr Dyer and Mr. J. H. Johnson.

It is I think agreed that Patents No. 1. 2 and 3 (4226, 4502 and 5306 of 1878) are of no present importance.

No. 4 (2402-1879) There is no doubt that in case of disclaimer claims 1, 3, 4, 5, 6 and 7 should be excised

Claims 8-11 relate to a longitudinal armature which might be considered to be an improvement in some respect on Siemen's invention, but it would be difficult to amend them by Disclaimer and I recommend their entire excision

Claim 12 may be retained.

Claim 13 relating to a device which though not at present used may according to Mr Edison turn out in the future to be very useful should also be retained.

Mr. Johnson doubts whether the subject matter of claims 14 and 15 is patentable - I think it would be safer to excise them.

Mr Dyer thinks that claim 16 for an induction bobbin nearly surrounded by the poles of the field magnet and the combination therewith of an abnormally large field magnet may be sustained, and explains fully the advantages of the arrangement. Mr. Edison takes the same view in his letter of March 6th 1882 page 3. It seems to me however that the difference between this arrangement and others is entirely

1

one of degree, and that the improvement effected, great as it may be, is yet not sufficiently great to support a Patent: it does not (as the "carbon filament" does) convert into an article of practical utility a thing which had previously been little more than a mere scientific curiosity. I adhere therefore to my original opinion that this claim should be abandoned.

Claim 2 relates to the removal of occluded gases from "metals and metallic conductors". Though in the opinion of Mr. J. H. Johnson and myself it does not apply to carbon it should be retained. Mr Dyer in his Memorandum on this Patent and Mr Edison in his letter of Feby. 15th. 1882 consider that Swan and others infringe the patent when they apply the process to their carbon lamps, inasmuch as they necessarily heat the metallic conductors at the same time as the carbons, and thus drive out the occluded gases. I do not think that this contention can be supported. According to the directions given in the specification the metal wires to be freed from gases are gradually brought to a "vivid incandescence" (page 10 line 6) But when carbon filaments are thus heated the metal conductors owing to their comparatively low resistance do not in point of fact attain even a red heat. They are not therefore freed from all occluded gases; nor is it absolutely necessary that they should be, since they are not intended when the lamp is in use to be subjected to such a high degree of temperature as would liberate occluded gas in sufficient quantity to materially affect the vacuum. Mr Edison moreover in a specification of much later date (562–1881. No. 17) practically admits that the ordinary process of heating the carbon filament is not sufficient to free the lamps &c from occluded gas. His words are as follows. "After as great a degree of vacuum as

possible has been produced in this way [i.e. by means of the air pump]. the carbon is heated to incandescence by means of a current of electricity and the occluded gases therein are thus driven off - There still remains however a quantity of gas in the clamps and the enlarged ends of the carbons which are never heated to incandescence by the passage of the current" (P.7 line 5). He then proceeds to describe a process for removing these gases by concentrating heat from some external source upon the clamps with a lense.

In my opinion there is little in this patent - (No.4) which is likely to be of immediate use? and since it is possible that some of the matter which it would at the present time be desirable to disclaim on the ground of want of utility might possibly in the future turn out to be of unexpected value, I think that the whole patent should for the present be left as it stands - (See Edison's letter 27th November 1881. page 12.)

(5) The Specification of Patent No 5 relating to the carbon filament lamp, should according to every opinion yet expressed be left in its original form Mr. Johnson has some doubts as to claims 2 and 3 but does not advise that they should be abandoned.

No.6 (5127 - 1879) is for the paper lamp. This patent as Mr. Johnson remarks should not be allowed to drop - Claim 3 for a filament with broad ends for clamping is particularly mentioned by Mr Dyer as being very important = It is to be observed that although in the preceding patent (No.5) it is directed that the two ends should be "increased in size" (P2. line 22) yet the date of No 5 being only one month earlier than that of

No 6 there is no prior publication - No disclaimer is necessary.

No. 7. (33-1880) has the appearance of having been originally intended for a provisional specification, to which a general claim has been appended. I do not think it would be possible to amend it by disclaimer. Mr Dyer agrees with me that such parts of it as relate to motors (p 5. line 15-46) cannot be included in the claim; but no object would so far as I can see be gained by striking them out - Mr. Edison comments on this specification in a letter of 6th March 1882 - p 6: he thinks that the above observations as to motors is incorrect.

No 8. (578-1880) relates to lamps, double sealing and sockets - Mr. Johnson considers it doubtful whether this patent is of sufficient importance to render it desirable to disclaim: but in the opinion of Mr. Dyer and myself it contains some very valuable features.

Claims 1 and 2 are we think undoubtedly good. the second for "double sealing" is especially important.

Claim 3 must certainly be rejected.

Claim 4 is bad - for want of invention in my opinion and by reason of anticipation in No. 3, p 4, l 6, and No. 4 p 10 l 41, in the opinion of Mr. Dyer.

I think that claim 5 may be retained - In my first Report I advised its excision - Mr. Johnson concurring, but both Mr. Dyer and Mr. Edison (letter of 6 March 1882) insist upon its greater practical value - The same observation applies to Claim 6.

Claim 7 - I at first reported favourably of this

claim, and no objection to it was raised by Mr. J.H. Johnson. Mr. Dyer also thinks it good. Upon reconsideration however I thought that there would be some risk in retaining it for the reason that the use of "a single natural fibre" 6 might be held not to be a patentable improvement upon the "fibrous materials" specified in No. 5 p1. l 28. But in case of the failure of Patent No 5 this claim might be of great value and in face of the opinions of Mr. Dyer and Mr. Johnson I feel some hesitation in advising its excision.

Claim 8 Mr. Edison (letter of 6 March 1882 p16) and Mr. Dyer advise the retention of Claim 8 on account of its importance and novelty, and Mr. Johnson says nothing against it. The invention seems to me to be a trifling one and I am not aware that it is ever practically applied, but since Mr. Edison attaches importance to it, it had better be retained.

Claims 9-17 relate to removable lamps and sockets - Mr. Johnson recommends that their number should be greatly reduced and Mr Dyer remarks that if this is done the 9th and 10th should be retained because they are the broadest. I do not think that a broad claim can be maintained for a lamp adapted to be readily removed by any conceivable device, but only for an arrangement which does not differ substantially from that indicated in the specification - The description occurs at p 5 l 35 to p 6 l 4. and at p 7 l 44 to p 8. l 28 it might perhaps be taken to include any system

of lamp and socket in which both are fitted with 2 springs or contact pieces insulated from each other but it is to be noted that no explicit mention is made of any socket in which the screw arrangement for closing the circuit is not used - this therefore might be held to be an essential part of the invention - The screw contact is however a very imperfect device and it would in practice be quickly displaced by arcing. The method of regulating the light by varying the pressure of the screw upon the plate is also impracticable, and that part of the specification which relates to it (p 8. lines 17 - 20) should certainly be erased.

It will be necessary to rely chiefly upon the lamp with its insulated contact pieces, but it is difficult to determine the limits of deviation from the exact form described and illustrated to which protection would be extended, for though the invention is new and useful it does not involve much ingenuity and the claim in respect of it would probably be construed narrowly.

After careful consideration I recommend that only No. 9. 10. and 14 of these claims be retained.

In this specification therefore claims 3. 4 11. 12. 13. 15. 16. and 17 should be abandoned and were it not for the importance attached to them by Mr. Edison and Mr. Draper I should have added to the list claims 5, 6, 7

and 8

No. 9. (602-1880). Almost the whole of the subject matter of this patent has been anticipated - Mr. Edson and Mr. Dyer recommend that it should be left in its present form - I concur.

No. 10. (1385-1880).

Claim 1 for the disk armature core is by far the most important, and in the opinion of Mr Dyer and myself is valid.

Claim 2 must be abandoned.

Claims 3 and 4 should also in my opinion be abandoned - Mr Dyer thinks that their retention would not weaken the patent, but admits that the device referred to is not used.

Claim 5 is considered by Mr. Dyer not to be highly important - As there is also some doubt of its validity it should be excised.

Claims 6 to 10 should in the opinion of both of us be abandoned

I agree with Mr. Dyer that the only thing of present importance in this patent is the first claim and recommend that all the others should be excised.

No. 11 (3765-1880).

Claim 1 is clearly bad.

/7.

Claims 2 and 3 are, as noted by Mr. Dyer in his Digest to a certain extent anticipated by patent No. 5 (p 4. line 20) where it is directed that the filament should be attached to the platinum wires by means of a mixture of lamp black and tar. Although this could hardly be strictly described as a carbonizable material I should prefer to excise these claims the more so as the process to which they relate is not now actually used.

Mr. Johnson thinks that the subject matter of Claims 4 and 5 is not patentable. The invention involved is certainly small and I advise their excision.

Claims 6 and 7 are interesting as relating to the kind of filament which Mr Edison almost exclusively uses at the present time. With regard to these claims Mr. Dyer in his Digest refers to patents No. 5 and No. 8 in which are mentioned "fibrous material" and "any natural fibre capable of carbonization especially such as are large and filamentary instead of cellular". Mr. Johnson too remarks that they are of doubtful validity. I fear that their subject matter does not shew sufficient improvement upon that of earlier patents to render them valid, though it would have been desirable to retain at least one of them if possible.

Claims 8, 9, 10 and 11 are said by Mr. Johnson to relate to most obvious arrangements containing little if any patentable invention. This seems to be true of No. 8 and the others could be so easily evaded that they are not worth retaining.

Claims 12, 13 and 14 are as Mr. Johnson says all practically for the same thing. Mr. Dyer's digest indicates that processes similar to those here claimed have been described in No. 6 with reference to the formation of paper horseshoes. I think that the extension to the case of wood is hardly patentable.

The utility of the subject matter of Claims 15 and 16 is doubted by Mr. Johnson, and he points out that they are both for the same thing. If either is retained, it should be the first.

Claims 17 and 18 are for matters of doubtful practical utility. I advise their excision.

Of Claims 19, 20, 21 and 22 Mr. Johnson recommends that the last three should be abandoned. I concur.

Claims 23, 24, 25 and 26 are characterized by Mr. Johnson as "exceedingly weak." The desired object could be so easily attained by means not covered by these claims that they are practically valueless.

I adhere to my original opinion with which Mr. Johnson agrees that Claims 27 and 28 cannot be supported. Mr. Dyer dissents.

Claims 29-31 relate to the use of mercury columns for making and forming connections. I originally advised their excision both because I doubted the utility of their subject matter and because a somewhat similar method of maintaining a vacuum and establishing a current without piercing wires through glass had been previously patented (Blomvies 455. 1880). Mr. Johnson concurred. Mr. Dyer however thinks

that the retention of the claims cannot weaken the patent and Mr. Edison considers them valuable. If any of them is to be retained it should I think be 29 but I recommend the excision of all.

Claims 32, 33, 34 relate to matters not mentioned in the Specification and must be excised.

Claims 35 and 36 should also in my opinion with which Mr. Johnson agrees, be abandoned. Mr. Dyer however thinks them good.

Claims 37 to 40 are thought good by Mr. Johnson and Mr. Dyer the former recommending that the number should be reduced. Though my original opinion was that it would be safer to disclaim them, I think upon further consideration that Nos. 37 and 39 may remain.

Claims 41 to 43 are good in the opinion of all of us. Mr. Johnson however says that only one of them is necessary. 41 seems to be sufficient.

The details of the combination referred to in Claim 44 are perhaps sufficiently unlike those referred to in Lane Fox's Patent 3494 - 1880 to render the claim valid. Of this Patent Mr. Johnson says "It should be well considered whether it contains anything of importance enough to hold if the rest be disclaimed" I am inclined to think that for the present at all events it will be well to leave it untouched.

No. 12 (3880 - 1880) The subject matter of this Patent closely approaches the borderline which divides patentable from unpatentable inventions. Since however it will be of extreme value if it can be supported it is desirable that some of the more doubtful claims should be excised.

Claims 1, 2 and 3 may be retained

Claim 4 is substantially identical with the preceding claims and should be excised

Claim 5 is to be abandoned as having been anticipated by Mr. Edisons prior Patent 5306 – 1878 (p 4 line 57)

Claim 6 relates to matter which in my opinion is clearly not patentable Mr. Dyer dissents, and Mr. Edison thinks that the claim is a very good one (Letter of 6th March 1882 p 10)

Claim 7 is an extension of Claim 2 and may be retained

Claim 8 should in the opinion of Mr. Dyer and myself be excised

Claims 9, 10, 11 and 12. The subject matter of these claims would perhaps be covered by the first three but I think there will be no harm in retaining them

Of this Patent Mr. Edison in his letter of March 6th makes the following remarks. "The use of distributing and feeding conductors is one of the most important things in our system of electric lighting. . . The more this point is studied the more important the claim for the feeders will be found to be . . . If every patent was lost except this one we would have the monopoly of the system of lighting by general distribution. . . It is impossible for me to insist too strongly on the very great importance of this Patent, as will be seen when the first attempts are made at general distribution"

In deference to these opinions I advise that the Patent be amended, but I entertain considerable doubt as to whether the subject matter of any

part of it is patentable

No. 14 (3964 - 1880)

Claim 1. must be abandoned

Claims 2, 3 and 4 may be retained

The subject matter of Claim 5 does not in my opinion differ in any essential respect from the arrangement shown in Wildes Patent (516 - 1863) It is immaterial that Wildes were permanent magnets while Mr. Edisons are electro magnets. It is true that Wildes separate magnets form in effect a single permanent magnet, but Mr. Edisons electro magnets are also connected so as to form in effect a single electro magnet. I think claim 5 should be abandoned

Claim 6. I do not think that the arrangement referred to differs sufficiently from that described in "Engineering" October 24th 1879 to support this claim. Mr. Edisons machine is much larger than the other; his governor acts upon the "cut off" instead of upon a throttle valve, and he uses no fly wheel. These are the only points of difference and the two combinations are so similar that this claim could hardly be supported

The same observations apply to claims 7, 8 and 9 all of which should in my opinion be excised Mr. Dyer dissents

Claims 10 and 11 are for the same thing

Claim 10 should be excised

Of Claims 12, 13, 14, 15 and 16, I recommend the excision of Claims 12 and 16 which so far as they differ from the others are too broad

As to claims 17, 18 and 19 see my Report

The observations thereon, contained in Mr. Edisons letter of March 6th 1882 p12 do not remove my original impression that the claims are

12

founded upon an erroneous conception, and I think they should be abandoned

Claim 20 seems to involve little invention. Since its subject matter is unimportant I think it should be abandoned. Mr. Dyer however thinks it valid

Claims 21, 22, 23 and 24 are good

Claim 25 must be excised

Claim 26 is good

No. 15 (4391 - 1880)

This Patent is of no present importance

No. 16 (539 - 1881)

Mr. Johnson says "The amount of invention involved in all the claims under this Patent is exceedingly small

There is considerable doubt whether any of the claims are legally tenable" Mr. Dyer considers that claims 1 to 11 cover highly useful and practicable devices He thinks that claims 12 and 13 should be excised but that claim 14 should be retained

In my opinion the Patent is of minor importance and may for the present at all events be allowed to remain as it is

No. 17 (562 - 1881)

Claim 1 may be retained

Claim 2 should be excised

Claim 3 is good in the opinion of Mr. Dyer Mr. Johnson however thinks that the term "equivalent gas" is too wide and that the claim if retained should be limited. Probably no gas is so suitable for the purpose described as chlorine; it would therefore be worth while to amend the claim by striking out the words "or equivalent gas"

Claims 4 and 5 must be excised

Claims 6 and 7 should be altered by substituting the word "Charcoal" for the words "a material which will absorb the gases or vapours thereby eliminated"

I think that Claim 8 may remain. Mr. Johnson however remarks that Claims 6, 7 and 8 seem scarcely necessary to cover the subject matter in question

As to Claim 9 the Specification does not clearly set forth the distinction between the process here claimed and that patented by Maxim (1649 - 1880) The distinction is indeed a very fine one and I entertain no doubt whatever that the claim should be excised. Mr. Johnson is of the same opinion. Mr. Edison (Observations on my Report page 11) and Mr. Dyer think that the claim is good on the ground that it is limited to heating in a vapour "when the vapour shall have access to every part of the carbon"

Claims 10 and 11. Mr. Johnson thinks that one of these is quite sufficient It seems to me that 11 is unnecessary

Claims 12 and 13 should be excised

Claim 14 Having regard to Mr. Johnson's observations I recommend the excision of this claim; the more so as the method referred to is clearly intended to apply only to the ends of the carbon filament a method previously proposed by Lane Fox (225 - 1881 p5 line 42)

Claims 15 and 16 may be retained. They relate to the process described in the Specification at p 10 line 5

Claim 17 should be excised

Claims 18 and 19. Upon consideration I think that the subject matter of these claims is anticipated by Jane For who (225 - 1881 p 5 line 24) describes a similar process the object of which is to reduce the resistance of the filaments "sufficiently to suit the electro motive force at which it is intended to work" This implies a reduction to a standard resistance. The process is I believe entirely abandoned by Mr. Edison as unsatisfactory

Mr. Johnson remarks that the word "nonconductor" in reference to carbon is used ambiguously in the ~~the~~ specification e.g. at p 5 lines 37 and 38 I think that carbon of high specific resistance is meant but this part of the specification will be excised

There need be no haste in amending this Patent since it contains little of present value

No 18. (768 - 1881)

Claim 1 is good

Claims 2 and 3 should be struck out (in accordance with Mr. Johnson's recommendation) as unnecessary.

Claim 4 is bad

This Patent is of immediate importance

No. 19 (792 - 1881)

The remark in my report that the method proposed would be wasteful of electricity was made too hastily

If such lamps as described were arranged in series the resistance of the series would be only $\frac{1}{n}$ of that of a single standard lamp; a resistance which at first sight appears to be very low. It is however exactly the same

as that of n standard lamps arranged in the ordinary way – the amount of electrical energy wasted in the conductors would therefore be the same in each case for equal light

Although I now fully recognise the value and importance of the device I still have some doubt as to whether it is proper subject matter for a patent. It is however probable that it may be supported. The claims are unnecessarily numerous but it will not in my opinion be desirable to disclaim anything

Claim 6 is the most dangerous but Mr. Dyer considers that it is confined to the peculiar manner of making the graphite conductor

No. 20. (1016 – 1881)

Mr. Dyer considers that the whole of this Patent is good. It is of small practical importance and I have not reconsidered the desirability of disclaiming any part of it

No. 21 (1240 – 1881)

This is very important and will not I think require any amendment though the number of claims is excessive

No. 22 (1783 – 1881)

The whole of this seems to be good excepting possibly Claim 2 with regard to which Mr. Dyer points out that there is a discrepancy between the provisional and complete specifications The object of the coil of fine copper wire is stated in the provisional to be the correction of errors arising from varying temperatures caused by the passage of the current through the cell. In the complete specification "rise or fall of temperature" is spoken of generally without reference to any cause. The device described

and illustrated in the complete exactly corresponds with that indicated in the provisional and I do not think that the discrepancy referred to is of serious importance

I have altered the following specifications in accordance with the suggestions which I have made above

No. 8 - 578 of 1880
10 - 1385 —
12 - 3880 —
14 - 3964 —
18 - 768 of 1881

Shelford Bidwell

1 Mitre Court Bldgs,
Temple
21 April 1882

C/B.

Recd 11 May 82

46

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C., 27 Apl 1882.

Thos. A. Edison Esq.
65 Fifth Avenue
New York
U.S.A.

Dear Sir,

In consigning all materials to this Company, be good enough to address them as follows

The Edison Electric Light Co. Ltd.
57 Holborn Viaduct
London.
England

and not to Mr Johnson as heretofore.

This will save Mr Johnson the trouble of endorsing the Bills of Lading which should now be done through the Secretary

Yours, Dear Sir,
Yours faithfully
S. Mole Secretary

57 Hol. Viaduct
London Apl 28/82

Thomas A Edison Esq
My Dr Edison

This will introduce to your good graces Mr Porsch who has done good work in my service here & who goes out to America with the view of bettering his fortunes, I believe you can make good use of him. His forte is in the line of draughting & calculation. Give him a trial Yours Truly

Edwd N. Johnson

74, COLEMAN STREET. E.C.

APRIL 29TH, 1882.

THOMAS A. EDISON ESQ.,

65, FIFTH AVENUE,

NEW YORK.

DEAR SIR,

OUR SECRETARY MR. WHITE HAD TO LEAVE LONDON FOR BRISTOL YESTER--DAY. BEFORE HIS DEPARTURE HE LEFT INSTRUCTIONS FOR A LETTER TO BE WRITTEN TO YOU CONFIRMING ORDERS RECENTLY CABLED TO YOU AND TRANSMITTING A SCHEDULE OF THE MACHINERY AND PLANT REQUIRED BY THIS COMPANY. IN MR. WHITE'S ABSENCE I AM UNABLE TO FIND THE SCHEDULE IN QUESTION AND THEREFORE AM OBLIGED TO POSTPONE SENDING SAME TO YOU UNTIL NEXT MAIL.

MEANTIME, HOWEVER, I MAY INFORM YOU THAT THE LETTER CONTAINS THE FOLLOWING PARAGRAPH WHICH HAS BEEN ADDED THERETO BY THE SANCTION OF THE BOARD.

"AS TO PAYMENT WE SHALL BE GLAD TO MAKE MATTERS EASY FOR YOU AND ALLOW YOU TO DRAW BEFORE COMPLETION OF AN ORDER FOR A CONSIDERABLE PROPORTION OF COST. PLEASE LET US HAVE YOUR VIEWS."

THIS LAST PARAGRAPH I MAY ADD IS IN THE HAND-WRITING OF MR. BOUVERIE WRITTEN AT THE FOOT OF THE LETTER WHICH WILL BE SENT YOU BY NEXT MAIL.

PLEASE NOTE THAT "SEVENFOUR" IS THE REGISTERED CABLE ADDRESS BETWEEN YOU AND THE COMPANY'S OFFICERS AT 74, COLEMAN STREET, AND THAT "FIFTYSEVEN" HOLDS GOOD FOR HOLBORN VIADUCT IN RESPECT TO MESSAGES FOR MR. JOHNSON PERSONALLY.

I AM, DEAR SIR,

YOURS TRULY,

Geo. Hayed

Rec

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., MAY 1ST, 1882.

T.A. EDISON ESQ.,

65, FIFTH AVENUE,

NEW YORK.

DEAR SIR,

REFERRING TO EXTRACTS FROM MR. JOHNSON'S CABLEGRAMS OF 11TH AND 21ST APRIL, AS FOLLOWS:-

''SEND TWENTY FIVE A DYNAMOS; PACK POLE PIECES MORE CAREFULLY. REPLY. . . . . AM WORKING HARD FOR BIG ORDERS DYNAMOS, LAMPS, FIXTURES WILL EXCEED TWENTY THOUSAND POUNDS CONSIDERA--BLY - PROBABLY CABLE IT TOMORROW. DYNAMOS NUMBERED TWO AND THREE MUST HAVE THIRTY TWO LAMPS. LAMP FACTORY SHOULD BE STARTED AT ONCE; LARGE ORDER CERTAIN. HAVE YOU CAPABLE MAN READY COME TO ENGLAND TAKE CHARGE CONSTRUCTION WORKS, IF SO, HOW SOON CAN HE COME AT OUR EXPENSE, WHAT ARE HIS TERMS.''

AND TO OUR CABLEGRAM OF 26TH APRIL, AS FOLLOWS:-

''OFFICIAL ORDER BY MAIL FOR FOLLOWING. ONE HUNDRED, HUNDRED LIGHT: TWENTY FIVE, TWO HUNDRED AND FIFTY LIGHT: THIRTY THOUSAND LAMPS: THIRTY TWO REGULATORS: THIRTY TWO INDICA--TORS: ASSORTMENT FIXTURES, SOCKETS, BLOCKS, SWITCHES ETC. FOR ABOVE. ALL DYNAMOS, BAR ARMATURES, LAMPS, CYLINDRICAL; SOC--KETS, MY PATTERN; STILL CONSIDERING LARGE DYNAMOS. ABOVE ORDER INCLUDES DYNAMOS ALREADY ORDERED.''

AND OF 1ST MAY:-

''SEND SIX ONE THOUSAND LIGHT DYNAMOS.''

I AM NOW DESIRED BY THE BOARD OF DIRECTORS TO TRANSMIT AN ORDER FOR MACHINERY AND PLANT AS PER SCHEDULE ENCLOSED AT THE PRICES

NAMED IN YOUR CABLEGRAM 13TH APRIL AS FOLLOWS:-

"READ YOUR CABLE MEAN YOU WANT BAR ARMATURES ALL MACHINES. HUNDRED LIGHTS, SIX HUNDRED DOLLARS: TWO FIFTY LIGHTS, THIR--TEEN FIFTY DOLLARS: CENTRAL STATION CARRYING THIRTEEN HUNDRED LIGHTS, TEN THOUSAND DOLLARS: OR EIGHT THOUSAND WITHOUT EN--GINE: CALCULATE ALL BAR ARMATURE MACHINES ABOUT SIX DOLLARS PER LIGHT IN BIG ORDERS."

IN CONFIRMING THIS ORDER, PLEASE STATE APPROXIMATELY THE TIME PROPOSED TO BE CONSUMED IN THE FULFILMENT, ALSO PLEASE ARRANGE FOR THE INSURANCE ON THE GOODS TO BE EFFECTED ON YOUR SIDE, AND ADVISE THE COM--PANY WHEN THE VARIOUS GOODS ARE DELIVERABLE F.O.B. IN NEW YORK.

AS TO PAYMENTS WE SHALL BE GLAD TO MAKE MATTERS EASY FOR YOU AND ALLOW YOU TO DRAW BEFORE COMPLETION OF AN ORDER FOR A CONSIDERABLE PROPORTION OF COST - PLEASE LET US HEAR YOUR VIEWS.

SINCE WRITING THE ABOVE WE HAVE YOURS OF 20TH APRIL. A BOARD MEETING WILL TAKE PLACE TOMORROW AFTER WHICH THE METHOD IN WHICH PAYMENTS WILL BE MADE TO YOU WILL BE CABLED.

WE HAVE ADDED TO THE LIST GIVEN BY CABLE ON 26TH APRIL, TWENTY FIVE SPARE BAR ARMATURES.

I AM, DEAR SIR,

YOURS TRULY,

Arnold White

SECRETARY.

P.S. I beg to confirm the following Cablegram despatched this day (2nd May, 1882)
"Cable Prices Electric Tubing Coupling
"Boxes Insulating Compound and Tape"

AW

Private.

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C., 2nd May 1882.

Samuel Insull Esqre
65 Fifth Avenue
New York

Dear Mr Insull,

I am very glad to get your letter of the 20th of April and thank you for writing when you are so much pressed. Hard work is not however exclusively confined to the other side of the Atlantic as we all find that neither night nor day is sufficient to get through all there is to perform. I received a packet of books & bulletins today, for which many thanks. The bulletins are most admirably drawn up and when I have got through a little of the arrears of work now pressing propose to organize a similar bulletin on this side.

You will have heard from Johnson that we have virtually concluded arrangements with the Lancashire people and for the South Eastern & South Western districts of London for £100,000 + ½ profits. I have also concluded a bargain to day for the sale of the rights of Croydon for the sum of £3000 + half profits. (Of course in every instance) this will make your B shares look very rosy.

I should like you to know that on the occasion of the Exhibition to the Press Johnson introduced me to Gouraud who held out his hand and I took it. A pleasant conversation ensued between us, so that there is now no obstacle to business being done in that quarter if, in Mr. Edison's interest and that of the Company, such a course is considered advisable.

I am very sorry to hear of Mr. Edison's indisposition and shall value very greatly any line that Mr. Edison may find time to write to me. I am very sorry to hear that you also are unwell and trust that the coming Spring will put you to rights. I had the pleasure of meeting your father the other day.

With kind regards,

Believe me,

Yours faithfully

Emile Berliner

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 4TH MAY, 1882

T.A. EDISON ESQ.,

65, FIFTH AVENUE,

NEW YORK.

DEAR SIR,

PLEASE SEE THAT IN FUTURE A SECOND PLATE IS PLACED UPON EACH DYNAMO MACHINE SUPPLIED TO THE COMPANY BEARING UPON IT:-

"SPECIALLY MANUFACTURED FOR THE EDISON ELECTRIC LIGHT COMPANY, LIMITED. LONDON."

YOURS TRULY,

Arnold White

SECRETARY.

ENCLOSURE

57, HOLBORN VIADUCT,
LONDON, E.C. 8TH. MAY, 1882.

THOS. A. EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

MY DEAR EDISON,

THE ENCLOSED WILL EXPLAIN ITSELF. THERE ARE TWO FIRMS OF VERITYS IN THE FIXTURE BUSINESS HERE. ONE OF THEM IS THE FIRM WITH WHICH I HAVE BEEN DEALING AND WHO ARE THE MOST ENTERPRISING, GO-AHEAD, STRAIGHTFORWARD BUSINESS PEOPLE I HAVE EVER MET WITH. THE OTHER FIRM IS TO THE BEST OF MY KNOWLEDGE AND BELIEF DIAMETRICALLY THE OPPOSITE. THIS LATTER FIRM IS THE ONE WHICH IS GOING OUT TO AMERICA OSTENSIBLY FOR THE PURPOSE OF INTRODUCING THEMSELVES TO YOU WITH A VIEW OF COMMANDING SOME CONNECTION WITH YOUR VARIOUS ENTERPRISES IN AMERICA BUT RATHER FOR THE PURPOSE OF MAKING USE HERE OF THE FACT OF HAVING SUCH CONNECTION THAN OF DOING ANY THING IN A PRACTICAL WAY IN AMERICA. YOU WILL OBLIGE ME BY HAVING NOTHING WHATEVER TO WITH THEM. I AM COMING PROVIDED WITH AN ASSORTMENT OF ORNAMENTAL DESIGNS, FIXTURES ETC., FOR MY ESTABLISHMENT WHICH WILL BE AMPLE FOR OUR CUSTOMERS AND HAVE MADE SUCH AN ARRANGEMENT WITH THE HONOURABLE VERITYS AS WILL ENABLE ME TO SUPPLY ANY AND ALL DEMANDS FOR WORK OF AN ARTISTIC CHARACTER THAT MAY BE MADE UPON US IN AMERICA.

PLEASE HAVE INSULL SHOW THIS TO BERGMANN.

YOURS VERY TRULY,

Edgar H. Johnson

[ENCLOSURE]

Private

B. VERITY & SONS
DESIGNERS, AND MANUFACTURERS OF LAMPS, CANDELABRA, &c

ONLY ADDRESS.
31 & 32, KING ST. COVENT GARDEN, W.C.

LONDON April 1 1882

E. H. Johnson Esq
Holborn Viaduct

Dear Sir

I wish to write in reference to E. R. Johnson & Jenny Verity (of Verity Bros) who are going to America this week with the intention of getting into the performance of Mr Edison & other of your friends & will trade as heretofore on our home. We would therefore ask you to kindly inform your friends as this is sent to put them on their guard

Very faithfully yours
George Verity

Form No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

NUMBER	SENT BY	RECD BY	CHECK
4	N.B.	H.S.	17 Collect

Received at W.U. 11.55 P.M. May 9 1882.

Dated London Feb N.Y.

To Fifty Seven Chas. T.A. Edison

Lamps equally apportioned to

Dynamos, ordered some for Lerlalid

Some for Central Station

No Sig

8000. 10 per hp London Volts. mark on socket

(inscribed. G.D. meaning general distribution

22000 Isolated 8½ per hp - various volts, but ~~Parkment~~ not mixed.

ordinarily. - Mark 2 Let I on socket of lamp over

Morning Isolated – I have a portmanteau this
order so as to enable you to send the majority
Lamps of every volts, hence the 500 must
be of Reg. Lunar Volts, and the volts
will do if we have to wait a year to
get them. I dont want any to open
horse power Lamps sent in
the Isolated order must be
6½ per horse power

Friday 28th

The Edison Electric Light Company, Limited,

74, Coleman Street

London, E.C., MAY 9TH 1882.

RECEIVED APR 22 1882

ANSWERED 24 May 1882

FILE No.

T.A. EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

PLEASE FORWARD WITH FIRST CON-
-SIGNMENT THE FOLLOWING, VIZ:-

100 COPIES MR. EDISON'S "INSTRUCTIONS.
FOR THE INSTALLATION OF ISOLATED PLANT."

YOURS TRULY,

Auhill
SECRETARY.

1

57, HOLBORN VIADUCT,
LONDON, E.C. 9TH. MAY, 1882.

RECEIVED
MAY 22 1882
ANSWERED

THOS. A EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK. U.S.A. .....188...

FILE No.....

MY DEAR EDISON,

I HAVE YOURS OF THE 26TH. APRIL, MANY COMMUNICA--TIONS FROM INSULL OF VARIOUS DATES, TELEGRAMS, ETC., ETC., ETC. I CANNOT RECALL NOW ALL THE SUBJECTS TREATED OF BUT GENERALLY, HAVE TO REMIND YOU THAT YOU HAVE BEEN TELEGRAPHING AND WRITING ME FOR THAT WHICH HAD ALREADY BEEN ACCOMPLISHED IN ONE WAY OR THE OTHER INVARIABLY BEFORE THE RECEPTION OF YOUR COMMUNICATIONS. YOU WANT WORK FOR THE LAMP FACTORY; YOU WANT ORDERS FOR GOERCK STREET; BERGMANN WANTS WORK; THE LAMP FACTORY COULD NOT BE STARTED TILL ORDERS WARRANTED IT. MY 32 & 52 CANDLE LAMP COULD NOT BE COMPLET--ED BECAUSE THE LAMP FACTORY WAS SHUT DOWN, AND THEN - WHEN THE ORDERS WERE SENT, YOU DID NOT APPEAR TO REALIZE THAT YOU ACTUALLY HAD THEM IN HAND. THE ORDER FOR SIX DYNAMOS WAS DELAYED, AS EX--PLAINED IN MY LETTERS AND ORIGINAL TELEGRAM FOR A LITTLE MORE CONSIDERATION TO BE GIVEN TO [redacted], AND WHEN THE ORDER WAS FINALLY SENT IT WAS SENT FROM THE HEAD OFFICE OF THE CO., 74, COLEMAN STREET, WHICH OFFICE HAS ADOPTED "SEVENFOUR" AS ITS CABLE CODE INSTEAD OF "FIFTYSEVEN" WHICH CONTINUES TO BE MY PRIVATE CODE ADDRESS. THEN YOU CABLED ME THAT YOU COULD NOT UN--DERTAKE SO MUCH WORK WITHOUT SOME PROVISION FOR MONEY. NOW ALL THIS I KNEW AND, KNOWING IT, PROVIDED FOR IT. AT THE VERY MEET--ING AT WHICH THESE ORDERS WERE DISCUSSED, I MADE A VERY CONSIDER-ABLE SPEECH IN WHICH I TOOK OCCASION TO SAY THAT IF ORDERS WERE NOW GIVEN YOU FOR MATERIAL THEY COULD BE PROMPTLY FILLED BUT THAT IF DELAYED UNTIL YOU HAD THE NEW YORK STATION STARTED YOUR WORKS WOULD BE SO OVERWHELMED WITH HOME ORDERS THAT PRACTICALLY WE WOULD BE SHUT OUT. ON THIS LINE OF ARGUMENT I GOT THE ORDER MADE FOR A VERY CONSIDERABLE QUANTITY OF MATERIAL AND ON THIS LINE OF ARGUMENT I FINALLY SUCCEEDED IN GETTING AN ORDER FOR SIX LARGE DYNAMOS. SO MUCH FOR THE ORDER. I THEN CALLED THE ATTENTION OF MR. BOUVERIE TO OUR FORMER EXPERIENCE AND TO THE GENERAL FACT THAT YOU WORK ALL YOUR ESTABLISHMENTS ON SUCH A CLOSE MARGIN THAT YOU COULD NOT TAKE AN ORDER OF THIS KIND IN HAND WITHOUT ADVANCED PAY--MENT ON ACCOUNT THEREOF. MR. BOUVERIE PROMPTLY PROPOSED AND SIR JOHN LUBBOCK SECONDED THAT A CONSIDERABLE SUM BE PAID YOU IN

ADVANCE. IT IS ALL THEREFORE ARRANGED AND WAS ARRANGED BEFORE THE RECEIPT OF YOUR TELEGRAM THAT WHATEVER MONEY YOU REQUIRE SHALL BE PAID TO YOU THROUGH DREXEL MORGAN & CO., ON ACCOUNT. OF COURSE I QUITE UNDERSTAND YOUR ANXIETY AND I QUITE UNDERSTAND THE OBJECT OF YOUR CONTINUAL NAGGING IN THAT YOU WISH TO ASSIST ME IN CARRY--ING YOUR POINTS. BUT I THINK YOU PUSHED IT A LITTLE FURTHER THAN WAS NECESSARY IN YOUR LAST CABLE. HOWEVER, IT IS ALL NOW ADJUST--ED. THERE REMAINS NOTHING TO BE DONE AS BETWEEN YOU, DREXEL MORGAN & CO., AND THE COMPANY, BUT FOR YOU TO FILL ORDERS IN HAND AND GET YOUR MONEY THEREFOR. THE LAST PAYMENT OF £1666 ON ACC--OUNT OF DREXEL MORGAN & CO.'S DISBURSEMENTS UNDER THE CONTRACT HAS BEEN MADE CONSEQUENTLY THE CONTRACT IS NOW FULFILLED IN EVERY DETAIL. THE MONEYS PAID BY DREXEL MORGAN & CO., SINCE THE CLOSING OF THE CONTRACT WILL BE RETURNED TO THEM JUST AS FAST AS THE AC-COUNTS ARE RECEIVED. PIERREPOINT MORGAN HAS DONE ME THE HONOUR OF CALLING AT THE VIADUCT TO SEE ME AND A FURTHER HONOUR OF EX--PRESSING HIMSELF AS VERY WELL PLEASED WITH ALL HE HAS SEEN IN ENGLAND AND IN FACT OF ALL THAT HAS BEEN DONE. BATCHELOR HAS BEEN TO SEE ME AND IS DELIGHTED WITH EVERYTHING, ESPECIALLY WITH MY ENGLISH COMPANY, ITS MEN AND ITS LINES. THERE IS ONE THING CERTAIN YOU WILL GET MORE MONEY OUT OF ENGLAND ALONE THAN YOU WILL GET OUT OF ALL THE REMAINDER OF THIS HEMISPHERE. I DO NOT LIKE THE CONTRACTS THE FRENCH PEOPLE ARE MAKING - THEY APPEAR TO ME TO BE DRAWN WITH ONE IDEA, AND THAT IS, ENDLESS COMPETITION FOR THE PURPOSE OF ULTIMATELY EUCHREING SOMEBODY. ON THE WHOLE THEREFORE I CAN CONSIDER THAT THE PROSPECT IN ENGLAND IS BRIHGT, AS COMPARED WITH ELSEHWRE.

COLONEL GOURGAUD HAS PROVED HIS INEFFICIENCY SINCE HE HAS BEEN WHOLLY UNABLE THUS FAR TO NEGOTIATE EVEN THE TWO COLONIES INDIA & AUSTRALIA. I AM DOING WHAT I CAN TO URGE UPON HIM THE IMPORTANCE OF ACCOMPLISHING SOMETHING IN THIS RESPECT BUT MAKE BUT LITTLE HEADWAY. HE TELLS ME THAT HE IS ONLY AWAITING THE PREPARATION OF THE PAPERS BY MR.WATERHOUSE. I HAVE ASKED MR. WATERHOUSE TO LET HIM HAVE THEM AS SOON AS POSSIBLE AS I HAVE GIVEN GOURGAUD TO UNDERSTAND THAT AS SOON AS THE PAPERS ARE IN HIS HANDS I SHALL EXPECT SOME DEMONSTRATION OF THE PROGRESS TO BE MADE MEANTIME THERE IS NOTHING MORE TO BE SAID IN REGARD TO THESE COLO--NIES.

CRYSTAL PALACE EXHIBITION CLOSES ON THE 3RD. JUNE. I HAVE HAD THE JURY IN TOW AND I AM SATISFIED THAT THE DIFFERENCE OF RECOGNITION AS BETWEEN YOUR WORK AND THAT OF OTHERS WILL BE MORE MARKED THAN IT WAS IN PARIS. THE VIADUCT CONTINUES TO RUN SATISFACTORILY, BUT WE ARE IN TROUBLE WITH NO.3. MACHINE; IT IS

CROSSED WITH THE BASE. A TEST MADE BY Hammer & FRANCIS DEVELOP-
-ED THE FACT THAT ONE OF THE BARS OF THE ARMATURE IS CROSSED WITH
THE IRON DISCS. I IMMEDIATELY TELEGRAPHED TO PARIS FOR Cunningham
TO COME BY THE FIRST TRAIN, BUT THE DAMNED FOOL TELEGRAPHED BACK
THAT BATCHELOR WAS AWAY. I REPLIED THAT I KNEW THAT, AND WAS
RESPONSIBLE FOR THE ORDER I GAVE HIM AND ASKED HIM TO COME AT
ONCE. I EXPECT HIM TO BE HERE TONIGHT. I THEN PROPOSED TO UN-
WIND THE ARMATURE, REMOVE THE BAR, REINSULATE IT, PUT IT BACK AND
REWIND THE ARMATURE. THIS IS THE FIRST REAL TROUBLE WE HAVE HAD
AND I AM IN HOPES WE SHALL BE ABLE TO TIDE OVER THE TIME NECESSARY
FOR REMEDYING IT WITHOUT A BREAKDOWN OF THE OTHER MACHINES; FOR
IN CASE ANYTHING SHOULD HAPPEN TO IT WHILE WE ARE REPAIRING THIS
ONE THE LIGHT ON THE VIADUCT WILL DISAPPEAR AND THEN YOU WILL HEAR
SUCH A HOWL AS NEVER WENT UP FROM BABYLON BEFORE. I QUITE REA-
-LIZE WHAT THIS WOULD MEAN TO ME. ALL THE GOOD WORK THAT I HAVE
DONE AND ALL THE CREDIT I HAVE RECEIVED THEREFOR, WOULD GO AS SO
MUCH CHAFF BEFORE A STRONG WIND. HOWEVER, IT IS ALL IN A LIFE-
TIME AND I AM TAKING THE CHANCES. NO DOUBT I COULD RUN THIS MA-
-CHINE WITH ONE SIDE CROSSED FOR A LONG TIME BUT I PREFER NOT TO
DO THAT SORT OF THING. YOU MUST IN FUTURE, AS NO DOUBT YOU ARE
FULLY AWARE, USE EVEN GREATER CAUTION IN THE MATTER OF INSULATION
THAN YOU HAVE HERETOFORE. A SLIGHT THING OF THIS KIND WITH A
MACHINE SO FAR AWAY IS LIKELY TO RESULT IN SERIOUS DAMAGE TO YOUR
INTERESTS. THE MACHINE COSTS TOO MUCH MONEY TO BE RUNNING CON-
-STANTLY SO NEAR THE VERGE OF DESTRUCTION. THE INSULATION IN THE
RODS WHICH LEAD FROM THE BRUSHES IS VERY BAD - IT HAS TOTALLY
GIVEN OUT OF NO.3. MACHINE AND WE SHALL HAVE TO PUT IN A BETTER
ARRANGEMENT. IN ALL OTHER RESPECTS WE ARE RUNNING ALONG NICELY.
I NOTE WHAT YOU SAY ABOUT THE TIT HAVING BROKEN OFF OF NO.2. BY
VIRTUE OF THE SUDDEN CHANGE OF LOAD, BUT I THINK YOU ARE WRONG.
WE HAD NOT DONE ANYTHING OF THAT SORT FOR A LONG TIME PAST.
I THINK IT IS A GRADUAL BREAK - THE RESULT OF VIBRATION; HOWEVER,
THAT IS A TRIFLING MATTER AND WAS SOON REMEDIED. YOUR TELEGRAM
OF TO-DAY SAYS THAT THE NEW MACHINES WILL BE FAR SUPERIOR TO THE
OLD, COMES JUST AT THE RIGHT TIME BUT I CAN USE IT AS A SORT OF
SALVE TO HEAL THE INJURIES WHICH OUR PEOPLE WILL HAVE RECEIVED BY
THE ANNOUNCEMENT OF THE TROUBLE WITH NO.3.

THIS TELEPHONE TRIAL IS INTERFERING SOMEWHAT WITH OUR
PROGRESS IN THE MATTER OF TESTING FOR COST, EFFICIENCY, AND SO ON,
SINCE DR.HOPKINSON & MYSELF ARE BOTH LOCKED UP BY IT EVERY DAY.
HOWEVER, WE HOPE IT WILL BE OVER BY THE END OF THIS WEEK; I HAVE
BEEN ON THE WITNESS-STAND AND HAVE SUCCEEDED IN MAKING AN IMPRES-
-SION ALTHOUGH I CAME ON AS THE LAST WITNESS. I SEND YOU A COPY
OF THE TIMES SO THAT YOU MAY SEE FOR YOURSELF WHAT IT SAYS. I AM

SATISFIED WE ARE GOING TO WIN IN THISFIGHT ALTHOUGH IT IS A VERY MUCH BETTER FOUGHT BATTLE THAN THAT AT EDINBURGH. ALDRED, HUS--BANDS & CREW ARE THE REAL BACKERS ALTHOUGH THEY ARE NOT THE PEO--PLE AGAINST WHOM THE ACTION IS BROUGHT. I WANT TO WIN THIS BE-CAUSE OF ITS BEARING ON THE ELECTRIC LIGHT PATENTS. I FIND A VERY STRIKING ANALOGY BETWEEN THE LAMP PATENT AND THE PATENT FOR THIS CARBON BUTTON. I WILL POINT THEM OUT TO YOU WHEN I SEE YOU. BUT BECAUSE OF THIS ANALOGY I AM ABLE AS THE TRIAL GOES ALONG TO MAKE INNUMERABLE POINTS WITH WEBSTER AND OUR EXPERTS AND THUS EDU--CATE THEM TO A BETTER UNDERSTANDING OF THE VITAL FEATURES OF THE LAMP PATENT. MY WORK IN THIS RESPECT IS SAID BY WATERHOUSE AND OTHERS TO BE SIMPLY WITHOUT PRICE. WE HAVE HAD ANOTHER CONFER--ENCE OVER THE LAMP PATENT AT WHICH SIR FREDK. BRAMWELL, MR. WEB--STER, DR.HOPKINSON, SHELFORD BIDWELL, THEODORE WATERHOUSE AND MY-SELF WERE PRESENT. IT IS ONLY ONE OF MANY THAT HAVE BEEN HELD LATELY AND IT HAD THE SAME RESULT AS OUR PREVIOUS ONES. THE GENERAL VERDICT NOW IS AS FOLLOWS;- THE PATENT IS NOT WITHOUT ITS WEAKNESSES - IT IS NOT A PATENT OF WHICH YOU CAN SAY - ''ON IT WE ARE SURE TO WIN'' - IT IS NOT A PATENT WHICH YOU SHAKE IN THE FACE OF INFRINGERS, AND CAUSE THEM TO QUAIL AND TREMBLE - BUT NEVERTHE-LESS IT IS A PATENT WHICH CAN BE DEFENDED, AND WHICH OUGHT TO BE DEFENDED. IT IS A PATENT WHICH CANNOT BE AMENDED. THERE IS NO WAY BY WHICH IT CAN BE IMPROVED BY PROCESS OF DISCLAIMER. THERE IS IN FACT NOTHING IN IT WHICH IF DISTRAINED WOULD RENDER THE RE--MAINDER OF THE PATENT STRONGER. THIS FACT IS AN IMPORTANT ONE SINCE THERE IS AN ENORMOUS DIFFERENCE OF VALUE ATTACHED TO A PAT--ENT BY THE COURTS WHICH COMES TO THEM IN ITS ORIGINAL FORM RATHER THAN IN A DRESS ALL TATTERED AND TORN. THIS BEING THE GENERAL VERDICT AND IT HAVING BEEN REACHED NOW SEVERAL TIMES IN SUCCESSION IT WAS FINALLY PRESENTED TO THE BOARD AT THEIR LAST MEETING AND MR.WATERHOUSE WAS INSTRUCTED TO PUSH THE PRELIMINARIES FORWARD WITH THE UTMOST DISPATCH, AND PREPARE FOR BATTLE ALL ALONG THE LINE. YOU MUST THEREFORE LOOK FOR SOME INTERESTING PROCEEDINGS BEFORE LONG AND ONE OF THE GREATEST CONTESTS THAT EVER WAS FOUGHT OVER AN ELECTRICAL INVENTION. THE BRUSH CO., SIEMENS, SWAN, LANE-FOX MAXIM, AND IN FACT THE WHOLE ARRAY WILL BE UNITED AGAINST US. IT IS A MONEY POWER THAT WILL BE ABLE TO PROLONG THE CONTEST ALMOST INDEFINITELY; BUT ON THE OTHER HAND YOU HAVE THE SUPPORT OF THE PUBLIC. THEY BELIEVE THAT THE THING BELONGS TO YOU. YOU HAVE PROVEN THAT IN ITS PRACTICAL DEVELOPMENT YOU ARE A LONG WAY AHEAD OF ALL OF THEM. YOU WILL HAVE THE SUPPORT OF THE BEST SCIENTIFIC AND LEGAL TALENT IN ENGLAND. YOU WILL HAVE THE MORAL AND FINANCIAL

SUPPORT OF SOME OF THE BEST KNOWN AND MOST HIGHLY RESPECTED NAMES IN ENGLISH FINANCIAL CIRCLES; AND FURTHER THAN THAT YOUR PATENT WILL BE FOUGHT TO THE BITTER END AT ANY COST. THEY HAVE VOTED THAT £30,000 BE SET ASIDE FOR THE PURPOSE AS A STARTER AND ARE FULLY PREPARED TO MAKE CASE TO THE HOUSE OF LORDS IF NECESSARY. MEANTIME THEY SUPPLEMENT THIS POWERFUL ASSER--TION OF THEIR RIGHTS BY HOLDING OUT THE OLIVE BRANCH OF PEACE AND IT IS NOT AT ALL IMPROBABLE THATTHE MOST DANGEROUS OF ALL OUR ANTAGONISTS (SWAN) WILL BE THE FIRST ONE TO SURRENDER AND RECOG--NIZE OUR CLAIMS. WHATEVER MAY BE DONE HOWEVER, IN THIS DIRECTION IT IS DISTINCTLY AGREED ALL ROUND, CAN ONLY BE DONE BY THE ABSOLUTE RECOGNITION OF OUR PATENTS. THE PRESENT PROPOSITION IS THAT A ROYALTY BE PAID US WE GRANTING A LICENSE TO MANUFACTURE UNDER OUR PATENT. IT IS TOO EARLY, HOWEVER, IN THIS STAGE OF THE PRO--CEEDINGS, TO VENTURE ANY OPINION AS TO WHAT MAY BE DONE.

PARLIAMENTARY BILL. WE ARE ALL BEFORE PARLIAMENT WITH SEVERAL BILLS, ASKING FOR PRIVILEGES FOR TAKING UP STREETS - THERE ARE SIX OF US IN ALL, AND THE GOVERNMENT IS BEFORE PARLIAMENT WITH A GENERAL BILL ASKING THAT PRIVILEGES BE ACCORDED. WE HAVE DETERMINED TO UNITE IN SUPPORT OF THE GOVERNMENT BILL AND WITHDRAW OUR SEVERAL PRIVATE BILLS. WE HAVE DONE THIS BECAUSE WE HAVE LEARNED THAT THE ENTIRE GAS INTEREST IS CONSOLIDATED TO FIGHT US. A CONFERENCE AT WESTMINSTER LAST SATURDAY MORNING WAS CALLED FOR THE PURPOSE OF SELECTING SOMEONE TO DRAFT OUR CASE AND PRESENT TO PARLIAMENT A STATEMENT OF THE PRESENT STAGE OF THE ART AS CONTRAST--ED WITH THE STATUS IN 1879 (WHEN PARLIAMENT LAST HAD THE MATTER BEFORE THEM.) AND THEN TO FOLLOW UP THIS STATEMENT BY VERBAL EVI--DENCE BEFORE THE PARLIAMENTARY COMMITTEE IN SUPPORT THEREOF. AFTER SOME LITTLE DISCUSSION THEY UNANIMOUSLY AGREED THAT I WAS THE MAN FOR THE WORK - WHAT DO YOU THINK OF THIS? IN ALL ENGLAND THESE SIX COMPANIES AGREED THAT THERE IS NO MAN SO CAPABLE OF PRES--ENTING AND SUPPORTING THEIR CAUSE AS THE "YOUNG AMERICAN," WHO AT PRESENT REPRESENTS YOU. SIEMENS HADONE OBJECTION TO ME AND THAT WAS THE FEAR THAT I WOULD BE TOO PARTISAN. SEVERAL DISSENT--ING VOICES WERE RAISED, SO MY INFORMANT TELLS ME - FOR I WAS NOT THERE, BUT IT WAS FINALLY ACCEPTED THAT I WAS QUITE CAPABLE OF DEALING WITH THE QUESTION APART FROM EDISON. I THEREFORE YESTERDAY, UPON RECEIVING A NOTICE OF MY SELECTION, DICTATED MY PRELIMINARY STATEMENT AND SUPPLEMENTED IT WITH THE ASSURANCE THAT I COME BEFORE A COMMITTEEE IN SUPPORT OF EVERY ASSERTION CONTAINED THEREIN. I HAVE OF COURSE, AS FAR AS POSSIBLE AVOIDED ANY DIRECT

REFERENCE TO YOUR OWN WORK, BUT I HAVE EXPLAINED TO MY FIR FRIENDS TO-DAY THAT IT IS IMPOSSIBLE TO MAKE A STATEMENT OF THE PRESENT STATE OF THE ART WITHOUT ASSERTING THAT CERTAIN THINGS ARE DONE WHICH YOU, AND YOU ALONE ACCOMPLISH. OF COURSE THIS WILL COME OUT MORE CLEARLY ON TESTIMONY. I UNDERSTAND THAT GIVING TESTIMONY OF THIS CHARACTER BEFORE A PARLIAMENTARY COMMITTEE, IS VERY LIKE GIVING TESTIMONY IN COURT. THE GAS COMPANIES WILL BE REPRESENTED BY ABLE COUNSEL FOR THE PURPOSE OF CHALLENGING EVERY STATEMENT THAT IS MADE AND TO BREAK IT DOWN IF POSSIBLE. MY ABILITY TO HOLD MY OWN UNDER CROSS-EXAMINATION, AS EVIDENCED BY MY TESTIMONY IN THE TELEPHONE CASE BUT A DAY OR TWO PREVIOUS, IS PROBABLY ONE OF THE CHIEF REASONS WHY I WAS SELECTED FOR THE WORK. AT ALL EVENTS I AM NOT MUCH CONCERNED ABOUT THE MATTER; IN POINT OF FACT I AM RATHER EAGER FOR THE FRAY. THIS IS MY ONE WORK WHICH I FEEL IT INCUMBENT ON ME TO DO YET, BEFORE LEAVING ENGLAND, AND RECOG--NIZING ITS IMPORTANCE, I HAVE CONSENTED TO REMAIN IN THIS COUNTRY A MONTH LONGER FOR THE PURPOSE OF ACCOMPLISHING IT.

YOUR CONSENT TO MY RETURN ON THE DAY FIXED IN MY PREVIOUS COMMUNICATION, YOU WILL OBSERVE HAS COST YOU NOTHING SINCE I DO NOT PROPOSE TO AVAIL MYSELF OF IT; BUT NEVERTHELESS I AM JUST AS MUCH OBLIGED. YOUR REMARK ABOUT YOUR NOT COMING TO ENGLAND; BE CAUSE, FORSOOTH, I AM SO ANXIOUS TO LEAVE - IS A LITTLE STRAINED, IT DON'T FOLLOW, BECAUSE I FIND LIFE IN ENGLAND VERY UNSATISFACTORY, THAT A MERE VISIT TO THAT COUNTRY WOULD BE UNPLEASANT. ON THE CONTRARY, I EXPECT TO VISIT ENGLAND FREQUENTLY MYSELF AND TO DERIVE A GOOD DEAL OF PLEASURE IN DOING SO.

I HAVE GIVEN ORDERS ALREADY THAT ALL THE EXHIBITS AT CRYSTAL PALACE, NOT STRICTLY BELONGING TO THE ELECTRIC LIGHT, SHALL BE PACKED AND SHIPPED DIRECTLY TO YOU, SO SOON AS THE EXHIBI--TION CLOSES.

I HAVE TO THANK YOU FOR YOUR TELEGRAM AUTHORIZING GOUREAU TO PAY ME 5 PER CENT OF THE ORIENTAL. IT DID NOT MET ME AS MUCH AS I EXPECTED (AS USUAL) FOR THE REASON THAT GOUREAUD EXACTED OF ME THAT I SHOULD PAY 5 PER CENT OF THE £4,000 YOU AND HE SUBSCRIB--ED TO THE TELEPHONE CO., AND 5 PER CENT OF THE £[illegible] YOU AND HE SUBSCRIBED TO THE AUTOMATIC ADJUSTMENT. THIS TOOK £250, OUT OF THE £450 THAT I SUPPOSED I WOULD RECEIVE; THUS I RECEIVED £200. ($1,000) BATCHELOR WAS OVER HERE A FEW DAYS SINCE AND RECEIVED HIS SHARE, WHICH WAS TO HIM A CONSIDERABLE WINDFALL, AND WENT AWAY QUITE HAPPY. HE RECEIVED FROM THE SALE OF HIS UNITEDS AND FROM THIS ORIENTAL TOGETHER, £1600 ~~AND SOME ODD POUNDS~~ IN CASH. THERE IS A MATTER HOWEVER, WHICH HE HAS TO ADJUST WITH YOU, AND WHICH HE

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ASKED ME TO WRITE TO YOU ABOUT. IT IS THIS; GOUREAUD HAS CHARGED YOU WITH YOUR PROPORTION OF THE £4,000 SUBSCRIBED TO THE SUPPLY CO., NOT DEDUCTING BATCHELOR'S PORTION THEREFROM. THE RESULT IS THAT BATCH. GETS THE ENTIRE AMOUNT DUE TO HIM WHILE YOU HAVE PAID TO GOUREAUD, ON ACCOUNT OF THIS SUPPLY CO., A PERCENTAGE ON WHAT HE GETS. YOU HAVE THEREFORE TO RECEIVE FROM BATCHELOR BACK AGAIN, THAT WHICH YOU HAVE PAID WHICH OF COURSE WILL BE 20 PER CENT OF THE AMOUNT THAT YOU ACTUALLY PAID ON ACCOUNT OF HIS £4,000. I WILL NOT GO INTO THE FIGURES, AS I UNDERSTAND FROM GOUREAUD THAT HE HAS SENT YOU A FULL STATEMENT OF THE WHOLE AFFAIR. ROUGHLY, BATCHELOR OWES YOU SOMETHING IN THE NEIGHBOURHOOD OF £400. I WILL LEAVE THE MATTER THEREFORE FOR YOU TO [redacted] WITH HIM.

I HAVE GOT HAMMER THE POSITION OF ASSISTANT ENGINEER AT £450 A YEAR - THE SALARY TO DATE FROM THE FORMATION OF THE CO., I THINK YOU WILL ADMIT THAT THAT WAS DOING PRETTY WELL. HE HAS A SPLENDID CHANCE FOR ADVANCING HIMSELF, AND I THINK YOU MAY RELY UPON HIS DOING IT.

THE ARTICLE IN THE ''SUNDAY TIMES'' ON THE COLLAPSE OF BOHM, FOX & CO., IS VERY SATISFACTORY.

I AM VERY SORRY TO HEAR YOU HAVE BEEN SICK; IN FACT, YOU SEEM TO HAVE HAD A SERIOUS PULL OF IT THIS TIME. PROBABLY IN THE COURSE OF A FEW YEARS, YOU WILL LEARN TO TAKE BETTER CARE OF YOURSELF - IF YOU DON'T, WE SHALL HAVE TO APPOINT A COMMITTEE TO DO IT.. I WILL CONSTITUTE MYSELF ONE MEMBER OF THAT COMMITTEE, ON MY RETURN TO AMERICA.

I AM NOW COMPELLED TO WRITE A LONG AND RAPID ACCOUNT OF AFFAIRS HERE TO MAJOR EDSON; BECAUSE FOR SOME REASON OR OTHER, THE INFORMATION WHICH IS CONVEYEDBY MY LETTERS TO YOU DOES NOT [redacted] REACH HIM, AND THEREFORE THE REFERENCE TO OUR WORK IN HIS BULLETIN IS MEAGRE, AND CONSISTS PRINCIPALLY OF QUOTATIONS FROM NEWSPAPERS RATHER THAN FROM INFORMATION FROM ME DIRECT. I HOPE THERE IS NOTHING AMISS WITH THE MAJOR.

VERY TRULY YOURS,

Edwd N. Johnson

the trouble with no 3 proves to be in the Commutator: We have it all apart. one of the blocks has been dead grounded & a big hole has been burned in the drum - the mica is eaten away

Cunningham is hard at work on it - & will probably have it OK again today. It's slow work as we have no conveniences for doing it. = Meantime we are running regularly & smoothly with No 2 - Can you make a new commutator for No 3 on your new plan. I am afraid this cross is only a beginning & that we shall frequently have trouble of this kind -

We have found also a cross between 2 of the bars. they are too close together -

The armature is all right - if we could only get at the commutator more easily the job would have been a simple one. I am keeping the Mishap from the Public but our own people know all about it. - Write me fully about the provisions against this sort of thing in the new machines Yours E H J

Duplicate

New York 10th May 1882

Received of E M I

6000 Dollars

on acct of and due me

on sale of English Bonds

Eight Cent

$[redacted]/100

Y A E S

Drexel, Morgan & Co.

45

13a.

EXECUTIVE OFFICE,
New York.

NORVIN GREEN, President.
A. R. BREWER, Sec'y.

Western Union Telegraph Company,

SUPERINTENDENT'S OFFICE,

New York may 11 1882

To T A Edison Esq
Menlo Pk. N.J.

We are requested by the Anglo-American Cable Co to Register the word Seventour as the address of Cable messages from and to Edison E L London. In accordance therewith the word named has been Registered on our books as your registered Cable address.

Very Resp'y
D. H. Erwin
Asst Supt
W.R.S.

ans Jul 8 No

87

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C., May 11 1882

T. A. Edison Esq
My dear Sir

Enclosed please find two copies of my pamphlet on your meter. I will send you more of them in a few days, as the rest of them are now in press. I found it necessary to do some thing of this sort, as the intellect over here is very volatile, and at the same time, answers a great number of questions that are put to you.

Also find a piece of thread which Swan uses in his lamps, the sample is the ordinary thread after it has been treated with Sulphuric acid, thus transforming it into parchment.

I wish you would favor me by having Insull pay whatever is due on my stock, and send me the bill, which I will settle as soon as I receive it.

Yours Very Truly
Francis Jehl

P.S. The article in The Engineering is mine, only that Mr Cooke, cook'd it up in his style and served it on a piece of paper.

[ENCLOSURE]

THE

EDISON

ELECTRIC LIGHT

METER.

FOR PRIVATE CIRCULATION ONLY.]

[ENCLOSURE]

PREFACE.

It is not my intention, in connection with these notes, to enumerate and explain the various apparatus that Mr. Edison has for the registration of an Electric Current, but to simply lay down such precepts as may aid the incipient scholar, whose duty it is to manipulate and manage the meter.

This being my sole object, an explanation of only one apparatus, which is now used by the Edison Electric Light Companies, is given.

FRANCIS JEHL.

[ENCLOSURE]

THE EDISON METER.

The principle upon which this Meter is founded is known as Electro-Metallurgy, that is, the disruption or tearing away of a metal by Electricity.

FUNDAMENTAL PRINCIPLES.

If an Electric Current, no matter how generated, whether by a dynamo machine, or voltaic element, be made to pass by means of platinum electrodes through some acidulated water, electrolysis takes place, that is, the current has the power of loosening and separating certain chemical compounds—in other words it analyses, decomposes, and separates the constituents of the compound through which it has passed. Any substance which is susceptible to decomposition by an Electric Current is termed an "Electrolyte."

By the term Electrodes is always understood the two extremities or poles which lead from a source of Electricity.

Electrodes are divided into Anodes and Cathodes.

The positive Electrode is called the Anode, and the negative the Cathode.

The products of decomposition, or the substances which gather at each pole during electrolysis, are termed "ions." That which gathers at the anode is called Anion, and that which gathers at the cathode is called Cation.

The amount of current required for decomposition varies greatly with different electrolytes.

Now in the above mentioned case, where the current passes through acidulated water, oxygen gas is liberated at the anode, and hydrogen at the cathode.

[ENCLOSURE]

If now into this liquid which contains the acid some crystals of sulphate of copper ($CuSo_4$) be thrown electrolytic action will still continue, but in a different manner, oxygen will be evolved, and copper will be deposited on one of the platinum electrodes, while the hydrogen takes the place of the copper in the solution. It may be represented chemically by $H_2O + CuSO_4$ before the current has passed, and $O + Cu + H_2 SO_4$ after the current has passed.

If in the above experiment, a copper electrode be substituted for the positive, it will be found that no gas will be liberated, the hydrogen, as before, will take the place of the copper in the solution—the oxygen, instead of escaping at the anode, will combine with the copper of the electrode and the sulphuric acid, to form sulphate of copper.

The chemical forces, called into action by the current, are so beautifully balanced, that in our last experiment the quantity of copper, supplied by the positive electrode, exactly equals the quantity withdrawn from our solution and deposited upon the negative electrode.

LAWS OF ELECTROLYSIS.

The following were demonstrated and discovered by Faraday.

Electrolysis cannot take place unless the electrolyte is a conductor.

The energy of the electrolytic action of the current is the same in all parts.

The same quantity of electricity—that is, the same electric current—decomposes chemically equivalent quantities of all the bodies which it traverses; from which it follows that the weights of the elements separated into these electrolytes are to each other as their chemical equivalents. For instance, in the decomposition of water it will be found that for every 18 parts of water decomposed two parts will be hydrogen and 16 oxygen; in order to form water from its two component gases we must take them in the above ratio.

It also follows from the preceding law that the quantity of the substance which is decomposed is proportional to the total quantity of electricity which passed through it, and is

independent of the time during which the electricity passed; the quantity corresponding to the passage of one unit is called the electro-chemical equivalent of the substance. Thus, when one unit of electricity passes through a solution of sulphate of zinc, having platinum electrodes, one electro-chemical equivalent of zinc appears at the cathode, and one electro-chemical equivalent of oxygen at the anode, while one electro-chemical equivalent of sulphate of zinc has disappeared. If, in the above experiment, zinc electrodes were used, the action would be as follows:—

For one unit of electricity, one electro-chemical equivalent of zinc would appear at the cathode, one electro-chemical equivalent of oxygen at the anode, there uniting with the zinc and sulphuric to form another electro-chemical equivalent of sulphate of zinc, and taking the place of the one just decomposed. This action continues, and keeps on depositing zinc on the cathode, and taking zinc off at the anode.

Upon the preceding law has Mr. Edison based his meter, and no matter how much current passes through it, for every electrical unit or fraction (which unit is called a "Weber,") there will be a corresponding number of units or fraction of a unit of the metal deposited.

The electric current is always associated with a flow of the components of the electrolyte in opposite directions. This is called "Electrolytic Conduction."

POLARISATION.

If, in a circuit consisting of an electrolytic cell containing acidulated water, having platinum plates for electrodes, we insert a single voltaic element together with a galvanometer to measure the current, we find that the strength of the current rapidly diminishes on closing the circuit.

Neither oxygen nor hydrogen appear in a gaseous form at the electrodes, but the electrodes have acquired new properties, showing that a chemical action has taken place at the surface of the plates. If now the battery be disconnected, and the galvanometer alone, with the electrolytic cell,

[ENCLOSURE]

remains in the circuit, it will be found on closing it that a current is traversing, and showing on the galvanometer that it is in an opposite direction to the original current. This current rapidly diminishes in strength and soon vanishes. It can also be seen that this current is not as strong as the primitive one. This acquirement of the electrodes is termed Polarisation.

Now, in the construction of an electric meter, such elements must be used as will not, under any circumstances, polarise, for suppose an electrolytic cell, which was capable of being polarised was used to ascertain the amount of current that was passing through the line in which it was inserted it would, in the first place, have the tendency to weaken the original current, and, if the instrument was shunted, as is essential in electric lighting, this counter current would all the while resist the original current, causing an erroneous deposit; it depositing less metal than would be deposited if there were no polarisation. Then, again, when the current on the line ceases to flow, this counter current would begin and redeposit some of the metal which the original current had deposited. Thus we see why any elements capable of polarisation would not do for an accurate meter. Then again, there is another consideration that comes into play, and that is, that nearly all elements when immersed in a solution, generate a small current, for example: two plates of copper in a solution of sulphate of copper, when connected with a galvanometer, will indicate the presence of a current. Now, in the above case, when the electrolytic cell was shunted it had, necessarily, a closed circuit. The circuit being closed this current, as indicated by the galvanometer in the last experiment, would become active, and deposit metal while there was no current circulating in the line. This current, although feeble, will in time deposit a considerable amount of copper, and cause an inaccuracy almost inconceivable. An endless number of experiments on this point were made by me, under Mr. Edison's direction, employing every element known, and on these grounds I state the above facts. A copper deposition cell, and some other metals, is suitable for large

currents, and when one takes the plates out of the solution, immediately after the current ceases to flow, but when it is required to register a very small current, such as $\frac{1}{1000}$ of a weber, and when the deposition cell is always on a closed circuit, it becomes necessary to use something else than copper in order to obtain accurate results.

Now, in order to get rid of this difficulty of polarisation, Mr. Edison found that by using electrodes of pure zinc, amalgamated with pure mercury, using great precaution so as to have no other elements which are capable of exciting a counter electromotive force, exist in the combination, so that under these conditions there is almost no polarisation, and great practical accuracy is ensured when an infinitesimal quantity of current is desired to be measured. The same is true if the currents be of large dimensions.

I may add that it be advisable in all electrical researches, whenever it becomes necessary to ascertain the magnitudes of an unknown current, and especially if it be small, that instead of using the copper deposition to arrive at our answer, an electrolytic element consisting of pure zincs amalgamated with pure mercury in a chemically pure solution of sulphate of zinc be used. The above conclusions have been arrived at from an exhaustive series of experiments carried on at Mr. Edison's laboratory, and which terminated in the adoption of zinc plates for his meters.

RESISTANCE OF ELECTROLYTES AND METALS.

It is very difficult to measure the electric resistance of some electrolytes on account of the polarisation of the electrodes. Now, in order to overcome this difficulty, one must use, as stated in the preceding article, zinc electrodes. There are other methods for ascertaining the resistance of solutions, but it is not necessary for me here to explain such methods. We are dealing with sulphate of zinc solution, which we use in our meters, and we have for our electrodes zinc plates. All we have to do is to observe the rules given in these notes on the preparation of the zinc plates, which includes also the solution. Then by inserting the cell in the proper arm of a Wheatstone bridge, we can very easily ascertain what its

[ENCLOSURE]

resistance is. Now here temperature plays an important part. It will be found that its resistance decreases as the temperature increases, or when the temperature decreases the resistance increases. Thus we see it has properties similar to carbon, for carbon will decrease its resistance when its temperature is increased and *vice versâ*. These properties are just the reverse of those exhibited by the metals. For take a piece of copper wire, and find its resistance, it will be found as the temperature increases, so also its resistance increases, exhibiting contrary effects when its temperature decreases.

We, therefore, lay down the following laws, namely:—

That the resistance of electrolytes diminish as the temperature increases.

The resistance of metals increases as the temperature increases.

Now it is obvious that, if we ascertain the resistance of a certain solution at different temperatures, we can ascertain the difference of its resistance between such temperatures. For example, a solution of sulphate of zinc at 0° C. offers a resistance of 1·80 ohms, and when at a temperature of 50° C. its resistance is diminished to ·34 ohms. Therefore the difference between those two temperatures is—

0°	1·80
50	·34
	1·46

showing a decrease of 1·46 ohms between the limits of 0° and 50° C. Now, if we remember that this difference is in contrary direction to that of copper, it will be seen that if we take a certain length of copper which changes its resistance between 0° and 50° in the same manner or proportion as the solution, that by placing the two in series, that is in the same circuit with each other one would compensate for the other, that while one diminishes the other increases, and the circuit in which they are placed maintains a constant resistance and does not vary with the temperature. This point, regarding the contrary effects exhibited by solutions and metals, Mr. Edison has utilised in his meter, and by its adoption he has a constant re-

sistance in the circuit where the deposition cells are placed, and without which an electric meter would be of no value where there is a change of temperature.

The laws regarding the resistance of metals are as follows:—Resistance in a wire of constant section and material is directly proportional to the length and inversely proportional to the area of the cross section.

The resistance of a solution is proportional to the distance between the plates and inversely to the surface of the plates.

It is needless for me to go further on explaining and demonstrating the theory of the meter, but I advise the party to whom the trust has been given of managing and manipulating them to familiarize himself as much as possible, and acquaint himself with the laws relating to them.

POINTS TO BE OBSERVED.

ZINC PLATES.

See that the copper wire terminating from the zinc plates, and especially at their junction, is well japanned, thereby creating good insulation.

Use great precaution to prevent any exposure of the copper terminals to the zinc sulphate solution. This is of vital importance.

Always clean the ends of the copper terminals in a diluted solution of nitric acid.

This should be executed after the amalgation of the plates. In amalgamating, care should be taken to remove any surplus mercury that may adhere to the plates. The process of amalgamation is as follows:—

1st. Immerse your zinc plates in a diluted solution of sulphuric acid, and afterwards in a bath of pure mercury. Drain the plates then, and rub them with a piece of clean cloth, and always with a downward motion, thereby causing the mercury, which has not yet amalgamated with the zinc, to be gathered in one corner.

This excess of mercury is very easily removed by a little practice, so that the whole plate presents an even surface. The plate is then thoroughly dried by means of a clean

[ENCLOSURE]

towel, and then left in a warm place for a short time, so as to insure its being perfectly dry. After which, when it is at an air temperature, it is ready for weighing. Always be sure that the surplus mercury in the screw hole is out. This is done by running one of the hard rubber screws through it.

SOLUTION FOR THE METER.

The solution should be made of 90 parts of pure sulphate of zinc and 100 parts of pure water. Before putting it into the meters it should always be tested by the hydrometer which at 18° Centigrade (64° Fahr.) will give it, if made according to the above formula, a specific gravity of $1\frac{33}{100}$. The hydrometer being a standard at 16° Centigrade (60 Fahr.). If any solution that has been used has by evaporation changed its specific gravity, it can always be standarized to the standard solution by means of the hydrometer.

The important point to be observed in making the solution, is, that it be composed of nothing but pure material; that is, what is known in chemistry as being chemically pure.

PUTTING THE ZINC PLATES TOGETHER READY FOR USE.

These must always be at a certain distance from each other, and this affected by means of pieces of hard rubber, which have been carefully cut to a known size.

Great accuracy is required for this task; and, as the piece of hard rubber is marked by means of a straight line running at right angles to the proper side, it is not difficult to always attain the desired results.

This mark on the hard rubber must always be at right angles to the zinc plates, when the zinc plates are screwed together by means of a hard rubber screw. They must not be pressed very hard, but just enough tension given to keep them well together, The zinc plates are then immersed in the bottles containing the sulphate solution which ought just to cover the top of the plates. They are then ready for use, inserting them so that the current shall act on the proper plate.

It is often that in the manipulation of the zincs the copper terminals become coated with mercury. When this is the

case, the terminal ought to be heated in a spirit lamp until all the mercury has evaporated. It becomes necessary if the heat of the lamp has scorched the japan, to remove it altogether and re-japan it.

TO ASCERTAIN THE DIRECTION OF THE CURRENT.

In setting a meter up at any place, the direction of the current must always be known, and the simplest method of ascertaining it is by means of a piece of bibulous paper which has been immersed in a solution of potassium ferricyanide (K_3 Fe 6 CN). Take this piece of paper and lay it on a piece of tinfoil or any other good conductor, and connect it by means of a wire to one of the main lines, to the other line connect another wire which has for its terminal a piece of iron. Now use this iron terminal as though it were a pencil upon the paper which has been saturated with the potassium ferricyanide, and see if you get a mark, or in other words decomposition.

The positive pole (wire leading from the copper in a voltaic element) will always give and produce a blue mark.

Another good method is by using bibulous paper which has been soaked in a solution of starch, to which potassium iodide is added. Now on touching the paper with the electrodes, a blue spot is produced at the positive pole.

Now we know that the current at the positive pole always flows from its source, and returns again by means of the negative wire. Knowing, therefore, the direction of the current, it is very easy to place the meter and connect it with the proper wires, so that the plate that has been weighed at the station shall receive the deposition.

MANIPULATION OF ZINCS PREVIOUS TO ESTIMATION OF CURRENT.

When the zincs are taken out of a meter through which the current has flowed they should first be washed in a gentle stream of water, care should be taken that the flow of the water be not heavy and with force, or else some of the deposition might be carried off. After this is done they should be unscrewed, and separated from each other and

[ENCLOSURE]

each again being washed, the final washing should be with distilled water.

Then the plates are to be laid gently upon a clean towel, or any other kind of clean cloth, and covering them with the same, gently press upon them, so as to let the towel absorb as much water and moisture as possible, when this is done, lay them aside in some warm place (about 70° or 80° F.) so as to be sure that they retain no moisture. Then when they are at the same temperature as the room in which the balance is, they are ready for weighing.

In the manipulation of the zincs the greatest care should be taken after they have been weighed that they are not rubbed in any manner nor handled much with the hand, in fact do not touch the amalgamated surface as the mere touching it with a greasy hand will tarnish it thereby producing resistance.

When the solution that has been used in a meter returns to the station, it should be put in a separate jar until tested with the hydrometer and adjusted if wrong to the original sp. gr. The used solution must first be filtered before any standardizing is done.

It is necessary that pure mercury should be used in the amalgamation of the zinc plates. Now ordinary mercury of commerce contains a great many impurities, both mechanical and otherwise. To free the mercury from mechanical impurities such as floating dust and dirt, put it into a bag of chamois leather and squeeze it through, or use a paper filter with a small pin hole at the bottom, the mercury coming through this hole, will leave the dust, &c., behind. To free it from foreign elements, such as lead, copper, &c., put the mercury into a flask containing one part of water and one part of nitric acid, shaking it well, and leaving it a reasonable time to dissolve the foreign matter. After which wash it well with water, it being then ready for use.

WEIGHING.

In using the balance, care should be taken that it be always adjusted, as some of the mercury of the zincs might

adhere to the paper on the scale plan, thereby causing an error. One should never handle or touch any part of the balance except when adjusting, as the heat of the hand will cause an error. The balance should always be protected from any air drafts, and the slides or windows always down when any weighing is done. The weights should always be handled by means of the tweezers. The balance should rest on a firm and solid table, so as to be free from vibrations, and must always be adjusted so as to be level.

Be careful so as not to have any light in close proximity to one end of the balance, such as a gas burner or an oil lamp, as the heat from the latter spreads unevenly upon the balance, thereby producing uneven expansion of the arm and causing considerable error.

METHOD OF CALCULATION.

Whenever a meter is set up so as to register the current at any place the weight of the plates are always recorded, so that when it comes back and is weighed again the gain is found, and from which gain the amount of current is easily computed that has passed through the meter.

The formula to ascertain the amount of current that has passed through a meter is:—

$$\frac{\text{Amount of gain in milligrammes.}}{1{\cdot}336} = \text{Current of Webers acting one hour.}$$

1·336 is our constant for one Weber per hour in our small meters (25 lights).

It may be well to illustrate the above rule by means of an example.

Suppose one set of zincs, before sent out, weight as follows:—

Monthly Zinc.	Quarter yearly.
92,800 Milligrammes.	92,000 Milligrammes.

Now after being in a house for about one month, having about 20 lights and using them about four hours a day, we find when the zincs are taken back to the station and weighed they have the following weight:—

Monthly zinc.	Quarter yearly.
95,317 milligrs.	93,229·2 milligrs.

[ENCLOSURE]

Now taking their original weight, and subtracting it from the latter, we find the gain—

Monthly zinc.	Quarter yearly.
95,317	93,229·2
92,800	92,600
2,517	629·2

Now we first see if our quarter yearly meter corresponds in proportion to our monthly one it must have about one-fourth the deposit. Therefore, dividing the gain of the monthly by the gain of the quarter yearly, we get our answer $\frac{2517}{629 \cdot 2} = 4$ which shows that it is all right.

It must be remembered that the quarter yearly is not taken out every month, when the first one is, but, as its name indicates, every quarter of a year or three months.

Well, we have found that the gain on the monthly meter was 2,517 milligrammes, and this divided by 1·336 gives us the webers that passed through that meter in one hour. That is, taking all the current that passed through the meter in that month, and concentrating it down to one hour, we have $\frac{2517}{1 \cdot 336} = 1{,}883$. Webers.

If the Company were charging A^d^ per Weber, per hour, the above would amount to 1,883·0 × A^d^

A WEBER is equivalent to 20·48 standard candles burning for one hour.

The above consumer has, therefore, had 1,883 × 20·48 = 38564. candles.

In order to arrive at about how many lamps were burning when the above amount of current was consumed, namely, 1,883. Webers, taking, as we have taken, 4 hours a day, for 30 days, making in all 120 hours, we divide 1883, by 120—thus giving the Webers consumed in one hour, which will be $\frac{1883}{120} = 15 \cdot 7$ Webers.

Now, as each lamp, under the conditions we have named before, consumes $\frac{11}{14}$ of a Weber, we have $20 \times \frac{11}{14} = \frac{220}{14} = 15 \cdot 7$ Webers.

Thus we see in both cases the facts corroborate with each other.

It must be remembered it makes no difference whether a Weber of current flows for 10 hours, or two Webers for

5 hours, or five Webers for 2 hours, the deposition of metal will in each case *be the same.*

The average light estimated in standard candles of what Gas Companies call a 5-foot burner, does not give more light than about 12 candles.

It becomes necessary in order to obtain an equivalent amount of light, equal in intensity to an Edison lamp, giving 16 candles, to employ a 7-foot gas burner.

From the above facts it is obvious that $\frac{11}{14}$ Webers = 16 candles, or in other words, $\frac{11}{14}$ Webers is equal to a 7-foot gas burner. Thus, in order to ascertain the equivalent of how many feet of gas we have consumed in our Electric Meter, we must divide our total number of Webers by $\frac{11}{14}$, the equivalent of a 7-foot burner. Thus, in the above example our Webers amounted to 1,883, and this divided by $\frac{11}{14} = \frac{1883}{\frac{11}{14}} = 2{,}396$, burners, burning 7 feet of gas per hour.

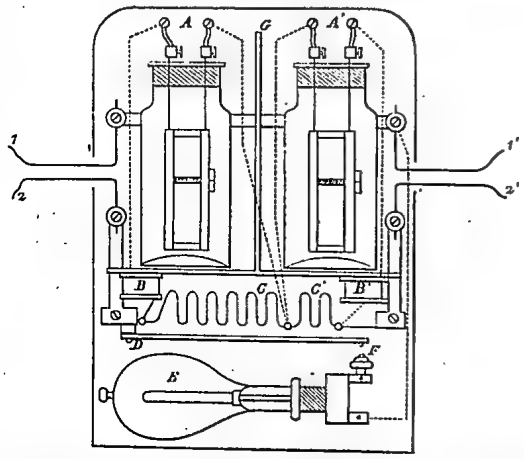
The constant for a 50-light meter is 1.377, which must be used instead of 1.336 when computing the current that has passed through such a meter.

GENERAL DESCRIPTION OF THE METER.

The Meter is divided into two compartments. The first, or the one on the left side, is termed the monthly cell. This is taken out every month by some employée of the Company, and another cell is substituted for it. The one taken out is returned to the Station, where the plate that has received the deposition is weighed. The cell on the right hand of the meter is termed the quarter yearly cell, and is a check cell. The party that has access to the monthly cell has not to the quarter yearly cell. This quarter yearly cell is taken out every three months and the deposit weighed. Its deposit must bear a certain proportion to the sum of the monthly meter deposit for those three months. If its deposit does not agree in proportion to the monthly cell, there is something wrong, or somebody has tampered

[ENCLOSURE]

with it. Thus we see the object of this auxiliary cell. In



the diagram A is the monthly cell, and A' is the quarter yearly cell. B' and B is the compensating resistance, the object of which was explained on page 8. In the small meters (25-light ones), the compensating resistance is 7·5 ohms at zero, and all measurement of resistance should be made at zero, or reduced to it. In the large meters (50-light ones) the compensating resistance amounts to 7· ohms at zero.

C and C' is the respective shunts from which the cells A and A' receive their current. The shunt C has a resistance of ·01 of an ohm, while the shunts C' has a resistance just one-fourth of that ·0025 of an ohm. We see thus why one cell receives four times as much current as the other, one shunt being four times as large.

D is a Thermo arrangement which Mr. Edison has devised in order to prevent the freezing of the sulphate of zinc solution in the winter. It consists of a strip of brass and steel rivetted well together. Now one of these two strips

expands more than the other, it therefore bows in one direction when heated, and as the other strip contracts more than the former when there is a decrease in temperature the combination bows in the opposite direction. It is, therefore, so adjusted, that where the temperature of the atmosphere is about 42° F. it bows and makes contact at the point F, which completes the circuit through the lamp E. The lamp heats the meter, and the heat takes effect on the thermo strip which then breaks the circuit again, until the heat is dissipated 1, 1', 2 and 2' is the place where the main lines enter and return. G is the partition which divides the two cells from each other.

The shunts used in the meters have a resistance of ·01 of an ohms at about 85° F., and simply consist of a band of German silver. It becomes necessary to adjust each one with a Standard resistance, as one cannot rely upon the length, thickness, and breadth of the band, as the alloy is not equal throughout the whole length, nor do we find that its diameter is exactly the same at different parts. Now the best manner to make a shunt is to put a band of German silver in circuit with a standard shunt or a standard resistance, including a battery, and take your deflections with a high resistance reflecting galvanometer, Fig, A will illustrate best the plan. Here we have battery B which ought to be a

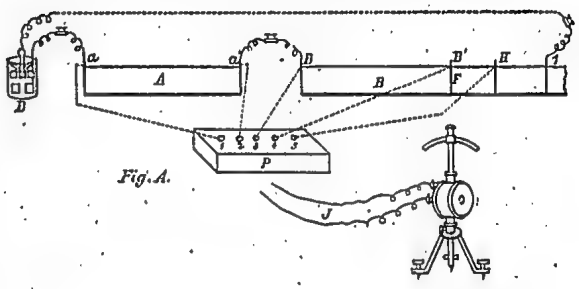


Fig. A.

constant one, such as a Daniell's, with the standard shunt A,

[ENCLOSURE]

and a band of German silver B, which we wish to adjust so as to make it equal to the one A: all are connected in series, and the circuit completed. Now we connect by means of small wires at *a* and *a'* at the standard shunt the two ends of the reflecting galvanometer G and get a deflection, this is, suppose 300. Now we connect the galvanometer to the wires leading tothe band of german-silver at band B and B' and notice their deflection. If it be not the same as our standard one, we move the wire F, which is capable of being slided up and down, a little further on, until we have a deflection equal to the standard. Care should be taken that in handling the band it is not heated by the hand as the temperature of A wants to be the same as that of B, having determined the point which makes both shunts alike, the wire F is then carefully soldered. Now as this is a shunt that has a resistance of ·01 of an ohms, it is also required to have the one which has ·0025 of an ohms juxtaposited with it. In fact the two shunts are made from one strip for where we leave off on the large shunt, we begin with the small one, for instance having soldered the wire F in the fig., we take another wire with a slit in and place it about H. And another small wire at the point H. Now we get the deflection between B' and H, and adjust it so that it gives a deflection one fourth of the deflection the standard one will give. P in the figure is a block of paraffin, with 5 holes containing mercury, and the extremities of the wires, immersed into them, thereby saving the trouble of connecting the galvanometer terminals with the wires, and also rendering great rapidity in manipulations. For one has only put the ends of the galvanometer into 1 and 2 and we get the deflection between *a* and *a'* when they are immersed into 3 and 4 we get the deflection between B and B', and when into 4 and 5, the deflection between B and H.

Before beginning to adjust a strip of German silver, heat it to redness over Bunsen burner, and then clean the oxydized surface by immersing it in some dilute nitric acid.

The one thing that should always be remembered in testing, is, that all your connections be good, and that none are partial ones.

In making and adjusting compensating resistances one must have them in a place where they are not subjected to a variation of temperature, in a small box for example,

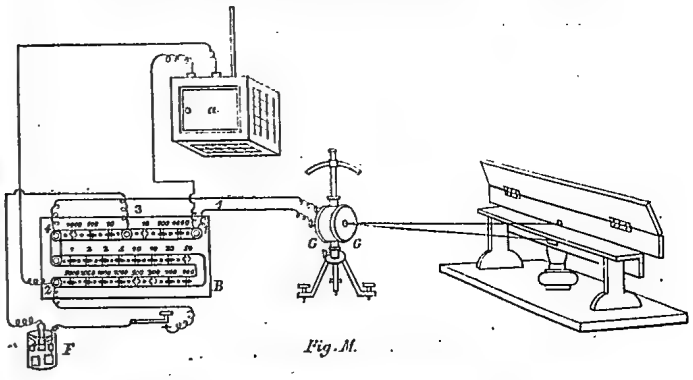


Fig. M.

where the two extremities lead out as shown in the figure M, which also shows how the connections on the Wheatstone bridge is made, when connected for measuring resistance. "*a*" is the box containing the compensating resistance which we have to adjust, there is a thermometer in the box in order to ascertain the temperature. The two ends of the resistance are then connected to the points 1 and 2 on the bridge, between 3 and 2 a battery is inserted with a key for making and closing the circuit, and between the points 1 and 4 the reflecting galvanometer. Now, supposing our bridge B is at a temperature of 18° cent., which at that temperature the box is correct, we also find that our temperature in the box A is 18°. Our compensating resistance must therefore be adjusted to 8·01 ohms if its resistance is or supposed to be 7·5 ohms at zero. For we know that the difference between 0° and 18° cent. is on the Fahr. scale, 32·4°, therefore, by our table on page 21, we see that the constant for thirty degrees is 1·0650, and for two degrees

[ENCLOSURE]

1·0042. We therefore add the fractional part of the latter to the constant for thirty degrees, which makes

$$1.0650 + \cdot 0042 = 1\cdot 0692$$

and this multiplied by 7·5 equals 8·01 ohms.

We can arrive at the same results and with more precision without having to convert cent. degrees into Fahr. degrees by employing Dr. Mathessen's formula:—

The resistance R of the metal at the temperature T expressed in degrees centigrade may be calculated from the resistance $\surd$ at 0° centigrade.

$$R = \surd(1 + T \cdot 00\,3824 + \cdot 00000\,126\ T^2)$$

Thus our resistance at 0° C is 7·5 ohms, and we want to see what it is at 18° we therefore multiply 18 by ·003824 18. × ·003824 = ·068832 adding 1· we have 1·068832 now adding to this the product of 18^2 by ·00000126 we have 18 × 18 = 324 × .00000126 = .000 50824 and this product added to 1·068832 we have

$$\begin{array}{r} 1\cdot 068832 \\ \cdot 00050824 \\ \hline 1\cdot 069 \end{array}$$

Therefore our constant is 1·069 and this multiplied by 7·5 = gives about 8·01 ohms. If it were the compensation resistance for the 50 light meters we would multiply the constant 1·069 by 7, which would be 7·48 ohms.

(The theory of a Wheatstone bridge is found almost in any text book on Electricity, and I advise the party who does not understand it to look it up).

The following table will help to compute the variation of resistance of wires at varying temperatures, from a low temperature to a higher one.

To increase from lower temperature to higher multiply the resistance by the number in column 2 (degree in F°).

No. of Degrees.	Column 2.	No. of Degrees.	Column 2.
0	1·	20	1·0428
1	1·0021	21	1·0450
2	1·0042	22	1·0472
3	1·0063	23	1·0494
4	1·0064	24	1·0516
5	1·0084	25	1·0538
6	1·0127	26	1·0561
7	1·0148	27	1·0583
8	1·0169	28	1·0605
9	1·0191	29	1·0627
10	1·0212	30	1·0650
11	1·0233		
12	1·0255		
13	1·0276		
14	1·0298		
15	1·0320		
16	1·0341		
17	1·0363		
18	1·0385		
19	1·0407		

Thus, for example: if we have a resistance of 7 ohms. at zero, what would it be at 60 Fahr? Knowing that zero equals 32 F°, and we wish to find the resistance at 60, there is a difference of 28 deg. between these limits. Multiplying 7 by 1·0605, which is our constant for 28 deg., we have the resistance, 7 × 1·0605 = 7·4235 ohms., which is our answer.

Every meter should be numbered and its record kept in a book, which is ruled in the following manner:—

Meter No. 5.			Name of Consumer, JONES. And Residence, 57, Holborn Viaduct.					
Date put in.	Weight of Plate.		Date taken out.	Weight of Plate.		Gain.		Webers consumed
	Monthly.	Quarterly.		Monthly.	Quarterly.	Monthly.	Quarterly.	
March. 20/82	90,800	90,400	April 20	91,400	...	1,100	...	823 3

[ENCLOSURE]

EXAMPLE.—A meter, whose number is 5, was put in Mr. Jones's House, at 57, Holborn Viaduct, on the 20th of March, 1882, and the plate's weight as follows: monthly plate, 90,300 millegrammes, the quarterly plate's weight, 90,400 millegrammes. Now, at the end of the month, on the 20th of April, the monthly one was taken out and weighed; its weight was 91,400 millegrammes, that being an increase of 1,100 millegrammes, and which, divided by 1,336, gives us the current consumed, which is 823·3.

APPENDIX.

NOTES UPON ZINC.

Density, 6·8 to 7·2. Fusing point, 412° C. (773° F.). Boiling point, 1040.° C. Atomic weight, 65.

Unacted upon by cold water that is free from air.

Slowly oxydised by boiling water, the latter being decomposed.

Easily soluble in dilute chlorhydric, sulphuric and nitric acids and almost in all the acids which are soluble in water.

Slowly soluble in warm aqueous solutions of caustic, potash and ammonium, and even in a hot solution of chloride of ammonia. A strong hot solution of chloride of zinc is capable of oxydizing and dissolving an excess of zinc, but on diluting it with water, oxychloride of zinc is immediately precipitated.

Soluble in carbonic acid water.

Glacial acetic acid, diluted with one volume of water, attacks zinc freely, but a single drop of bi-chloride of platinum communicates a most remarkable re-action.

Diluted butyric acid behaves the same as acetic acid.

An energetic action upon zinc is also produced by various saline solutions after being mixed with various metallic solutions.

In this category may be enumerated aqueous solutions of the chlorides of potassium and sodium, the sulphates of soda,

potash and magnesia, and the hydrates of soda, potash and ammonia, it being only necessary to add a drop of bi-chloride of platinum in order that these solutions shall cause evolution of hydrogen. Sea water, river water, and even distilled water is decomposed by zinc in presence of small quantities of some of these metallic solutions.

Upon the re-actions above described light exerts a decided influence. As a general rule the disengagement of hydrogen is slower when light is avoided.

Most of the salts of zinc are soluble in water, and all which are insoluble dissolve in chlorhydric acid and in a hot aqueous solution of chloride ammonium.

ZINC-SULPHATE.

Pure sulphate of zinc should be completely soluble in water, ammonia being added to the solution, produces at first a white precipitate, but which an excess of ammonia should completely redissolve.

The presence of iron is detected by dissolving a portion of the sample, and adding an excess of ammonia, which will produce reddish-brown flakes of peroxide of iron.

When only a trace of iron exists, ammonia may fail in showing it; but, in that case, the precipitate produced by hydrosulphuret of ammonia, instead of being white, will be grey or black. A trace of iron may also be detected by dissolving a portion of the sample in water, adding nitric acid, and boiling, neutralizing the acid, as nearly as possible with ammonia, and then testing with infusion of galls, which will produce a black colour (ink) if iron be present.

If *copper* is present, a slight excess of ammonia being poured in the solution of the salt under examination will produce a beautiful blue colour; and, moreover, the solution of the salt, being first acidified with hydrochloric acid, and then treated by a stream of sulphuretted hydrogen, will produce a black precipitate. If only a trace of copper is present, the precipitate, instead of being black, is dark brown.

[ENCLOSURE]

METRICAL SYSTEM.

	Grammes.	Avoirdupois Ounces.	Avoirdupois lbs.	Grains Troy.
Milligramme	·001	—	—	·015
Centigramme ...	·01	—	—	·154
Decigramme	·1	—	—	1.543
Gramme	1·	·035	·0022	15·432
Decagramme	10·	·350	·0220	
Hectogramme ...	100·	3·527	·2204	Oz. Troy.
Kilogramme	1,000·	35·27	2·2046	32·15
Myriagramme ...	10,000·	—	22·04	—
Quintal	100,000·	—	220·46	—
Millier or Bar ...	1,000,000·	—	2204·62	—

To convert Centigrade, Fahrenheit, or Réaumur degrees into one another.

Let F = No. of Fahrenheit degrees.
" C = " Centigrade "
" R = " Réaumur "

$$F = \frac{9}{5} + 32$$

$$C = \frac{5\,(F-32)}{9}$$

$$R = \frac{4\,(F-32)}{9}$$

$$F = \frac{9\,R}{4} + 32$$

Freezing point at 32° Fahrenheit
" " 0° Centigrade
" " 0° Réaumur

Boiling point at 212° Fahrenheit
" " 100° Centigrade
" " 80° Réaumur

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 11TH MAY, 1882

SAMUEL INSULL ESQ.,
65, FIFTH AVENUE,
NEW YORK.

RECEIVED
APR 22 1882
ANSWERED

FILE No. 188

DEAR MR. INSULL,

I AM VERY MUCH GRATIFIED AT RECEIVING A LETTER SIGN--ED BY MR. EDISON WHICH I ASCRIBE TO YOUR GOOD OFFICES AND I ACCORDING--LY THANK YOU FOR THE SAME AND PERHAPS YOU WILL BE GOOD ENOUGH TO EX--PRESS MY THANKS TO MR. EDISON.

JOHNSON MAY POSSIBLY NOT HAVE TOLD YOU THE EXTENT TO WHICH THE COMPANY HAS GONE IN THE SALE OF CONCESSIONS. WE CAN SEE OUR WAY NOW TO SOMETHING LIKE £200,000 IN HARD CASH AND THE VALUE OF THE SHARES IS ALREADY ADMITTED TO BE THREE TIMES THE NOMINAL AMOUNT. ALTHOUGH THIS IS NOT A POINT THAT WOULD INFLUENCE ANY OF THE EXISTING SHARE-HOLDERS STILL SOME PEOPLE ARE GLAD TO KNOW THAT THE UNDERTAKING IS SUC--CEEDING even BETTER THAN IT PROMISED TO DO TWO MONTHS AGO.

YOURS TRULY,

Twelvetrees

RECEIVED
MAY 25 1882
ANSWERED
25th May 1882
FILE No.....

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 11TH MAY, 1882.

THOMAS A. EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

REFERRING TO OUR CABLE TO YOU OF THE 20TH OF APRIL " WANT MAN FAMILIAR WITH DETAILS DYNAMOS AND DYNAMO CONSTRUCTION COMPANY IN MANCHESTER" AND YOURS OF THE 2ND INSTANT " CANNOT FIND MAN FOR DYNAMO BUILDINGS SEND OVER GOOD LIVE MAN WE WILL INSTRUCT HIM HERE" I NOW BEG TO INFORM YOU THAT A REPRESENTATIVE FROM THE MANCHESTER DISTRICT COM--PANY WILL LEAVE FOR NEW YORK NEXT WEEK.

YOURS TRULY,

Arnold White

SECRETARY.

Telephone No. 346.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

Ans 29 May

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 16TH MAY, 1882

T.A. EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

MR. OLRICK PROCEEDS TO NEW YORK IN CONFORMITY WITH THE CABLES WHICH HAVE PASSED BETWEEN YOURSELF AND MR. JOHNSON OF WHICH COPIES ARE ANNEXED AND THE DIRECTORS OF THE COMPANY WILL BE GREATLY OBLIGED IF YOU WILL GIVE HIM FACILITIES FOR THE PURPOSE OF ENABLING HIM TO GRASP THE PROCESSES OF MANUFACTURING DYNAMOS AND PLANT. MR. OLRICK IS A GOOD MECHANICIAN, INTELLIGENT, EDUCATED AND OF GOOD ADDRESS AND NOT AFRAID TO WORK WITH HIS OWN HANDS TO ACQUIRE KNOWLEDGE.

YOURS TRULY,

Anhee

SECRETARY.

FIFTY SEVEN, NEW YORK

APRIL 22ND.

WANT MAN FAMILIAR WITH DETAILS DYNAMO AND DYNAMO CONSTRUCTION COMPANY IN MANCHESTER

FIFTY SEVEN, LONDON.

CANNOT FIND MAN FOR DYNAMO BUILDINGS SEND OVER GOOD LIVE MAN WE WILL INSTRUCT HIM HERE

Engineering Office - Maine Maple

Extract from the MANCHESTER GUARDIAN, *May 18th, 1882.*

THE EDISON ELECTRIC LIGHT IN SALFORD.

It is getting almost too late in the day to speak of the success of the electric light—that was demonstrated beyond question at the Crystal Palace Exhibition. It remains, however, for the light to be put to the purposes of every-day life. An important step in this direction has been taken by Messrs. Mather and Platt, of the Salford Ironworks, where, for the first time in England, the Edison system has been applied to the practical purpose of illuminating the offices and workshops. The electricity is induced from two dynamo-electrical machines, each of 60-light power, and driven by a small single-cylinder engine of six nominal horse power. The conductors are carried from the dynamos, which are placed on the ground floor, through two workshops containing all kinds of engine tools, fitters' benches, &c., and through a suite of offices and draughtsmen's rooms. At present the workshops have 81 lamps in a circuit, and the offices 53, making a total of 134. The lamps, which, as already stated, are of the Edison type, consist of a thin filament of carbon hermetically sealed into a glass globe, shaped, for the most part, like a pear, from which the air is afterwards exhausted. As regards the durability of these lamps, they have been tested to 1,000 hours, but taking 500 hours as the minimum, which is the average length of time per annum during which lights are used in mills and workshops, the lamps would thus last one year. The cost of renewal is trifling. The character of the light is that of a white-heat coal, and is entirely free from the unpleasant blue glare of the electric arc as well as the painful fluctuations due to defective feeding apparatus and the want of homogeneity in the carbons burned. Nominally the lamps used at Messrs. Mather and Platt's are of 16-candle power, but the light has many advantages over an ordinary gas jet of that power. It is absolutely steady—a matter of great consequence where work of a delicate nature like that of the draughtsman has to be done, whilst to the mechanic or the spinner the matter is of hardly less consequence. The lamps are attached to flexible brackets, and the workman can detach them at pleasure, and use them for the purpose of giving light to any part of his work. Each light can be turned off or on by a tap similar to the ordinary gas tap. There is no danger of fire or of accidents to workpeople under the Edison system. Owing to the extremely low resistance to the electric current, the conducting wires may be held in the hand with impunity, and in each lamp-holder is placed a safety wire, which melts at a low temperature, and breaks the current should the lamp from any accidental cause be raised to an abnormal state of incandescence The most pleasing example of electric lighting is to be seen in Messrs. Mather and Platt's offices, which are illuminated by means both of single jets and chandeliers. A soft and steady light, much more pleasant to the eye than that given by gas, is diffused over the rooms, and no smell and little or no heat is produced. We believe Messrs. Mather and Platt are so satisfied with the partial application of the Edison light that they intend to adopt the system throughout their extensive works, where upwards of 1,000 lights are required.

DREXEL, MORGAN & CO.
Wall St. Corner Broad.
New York.
DREXEL & CO.
Philadelphia.
DREXEL HARJES & CO.
Paris.

Drexel Morgan & Co
J. Christmann

New York May 20 1882

Thos. A. Edison Esq
Menlo Park
N.J.

Dear Sir
We beg to advise having received the following cable from Mr White, Manager of the Edison Electric Light Co Ld of London:
"Pay Edison on account large dynamos £5.000. immediately, 5000 June first, 5000 fifteenth, 5.000. July first, 5.000. fifteenth, 7.500. August first, 7500 fifteenth, 10.000. September first."

Yours very truly,
Drexel Morgan & Co
J. Christmann

To
Dr. 22.

Enclosure

57 Holborn Viaduct
Holborn
London E.C. May 21st 1882

Thomas A Edison Esq
65 Fifth Avenue
New York.

My dear Edison,

Since writing to you last we have had plenty of excitement.

Telephone Fight. Parliamentary Committee investigation, tremendous excitement on the Stock Exchange on Electrical matters, daily sittings of our own Board to bring things to a focus so as to bring out Edison Company's and a total collapse of No 3 Dynamo. These are some of the interesting features of the past fortnight.

Dynamo. The Dynamo gave indications of giving out. We managed to run it however through the night and the next night to use the other. A thorough test developed the fact that it was heavily grounded with the base. I telegraphed for Cunningham who came. We then took the machine entirely apart, spread it all about the floor raising the armature up supporting it on blocks laid across the regular bearings and disconnecting the commutator from the armature bars discovered by testing that the trouble was entirely in the commutator. On locating the particular bars they were removed after very great difficulty. The end cap having become thoroughly welded on special appliances had to be made to force it off. On removing a few of the bars it was discovered that the mica was thoroughly burnt through

and great holes eaten into the iron beneath both in the centre of the commutator and at one end these bars were cleaned up, new insulation prepared and put in, the commutator put together again, tested by itself, the armature retested, the two united, the machine put together, and the whole thing started again when for two nights it worked in a manner superior to any previous performance. It then began to spark very badly and the next night grew worse. Mr Hammer on testing discovered there was a bad connection in one of the lugs. It was screwed up and the whole of the connections carefully gone over again but on starting up the next night in a few moments a similar fault was discovered. We however ran through the night and on making the test again the next day found another loose connection had developed. This was removed and Hood carefully went over every connection again. Last night she ran much better and in fact very satisfactory but still giving slight indications of weakness. I am of the impression that Cunningham and Hood were unable to make the connections as firm and as good as they were made in the shop and that consequently we shall be liable to a recurrence of this loosening if we cannot do something to prevent it. We are now considering what is to be done. Meantime No 3 has fallen from our good graces and No 2 by its reliable performances takes first rank a curious effect was produced by this trouble in the connections. The machine tested perfectly satisfactory, everything seeming to be clear, no crosses either as between bar and bar or as between the bars and the base and yet when the machine was started the sparking was heavy and the strain on the engine considerably

above the normal; the coal consumption was very considerable during the time this trouble remained and as it was gradually got rid of the engine worked much easier. I account for this readily enough now but could not understand it at the time. Flood with his wonderful patience and capacity for tinkering and doctoring, will gradually eliminate this last trouble and restore the machine to its glory. ~~Now~~ All this this we have done by great watchfulness and care we were able to prevent even so much as a second's failure of the light so that our troubles are known only to ourselves. I wish to call your attention for the purpose of obviating similar faults in the new machines, to two or three things which have come under our experience here.

Fine Hurrah! No 3 all OK again & it is now working beautifully

1. The exceeding great difficulty in locating a fault would not some provision be made at stated points for quickly breaking the commutator, armature circuit so as to permit of technical tests?

2. (Though this I understand you have partly provided for) Greater facility must be afforded to getting at the guts of the commutator. If I understand your new commutator rightly the only thing that is removable will be the copper bars which you propose to constitute a facing to brass bars underneath. Should these brass bars underneath become cropped with a bite or with each other they would be as difficult to get at as the present ones. Therefore your new plan would not remedy this difficulty.

3. I would suggest in testing these machines you do not subject them to such an enormous strain as this one has evidently been ~~subjected to~~. Its action at times gives the impression of general weakness while at other times it seems to perform magnificently.

4. If it be possible to devise a means for holding the bars other than by the present method of winding with steel wire I think it exceedingly important that it should be done. I know the great difficulty of doing this and the reasons why you prefer the wire winding. I only mention it in the hope that if you bring your mind to the subject afresh you may hit upon some happy plan which escaped you when considering the subject before. Already access for the purpose of test and for the purpose of repairs to every part of this armature will add enormously to the practical character of the machine as a whole. If I understand your cable aught the new machines will have more powerful engines I am glad of this and think it is in a right direction. Hood has some important suggestions to make in respect to the engines and to the bearings which I think you will be glad to have. He has been very faithful and very valuable in every way but is exceedingly anxious now to get back to New York. He has had for the past 6 weeks two thoroughly first class Engineers in training and has fully qualified them to run the machine. I have therefore promised him that he shall be released by the first to the middle of June. One of the Engineers in question is a very high class man and comes from Messrs Hayward Tyler & Co. (our Contracting Engineers) and will I am sure occupy a high position in the future management of these large machines.

Holloway will remain in England and I have secured for him a very good outlook. I have further obtained for them both a proper recognition of their care and watchfulness in the shape of a bonus of £50 each which I promised to them in the early days if they

would run their respective plants without failure to the date of my departure. Holloway has never had a moments break down of any sort or character at the Palace and as that plant is running to perfection almost without a thought from any of us there is no doubt it will continue to do so until the close of the Exhibition on the 3rd June. We have been of course close on the verge of failure at the Viaduct for watchfulness and care on the part of both Hood & Hammer has resulted in tiding us over every critical stage and enabled us to keep the thing constantly going. I have now but little fear that we shall continue to do to the end that is until the two machines have had all their little weaknesses eliminated and settled down to a long continued smooth run. There is but one criticism passed upon us and that is that our

Street Lighting

is insufficient. The 32 candle lamps have met with nothing but disaster. In the first place there were 36 of them broken by the Street lamp cleaners on the very first day they were put up. A smaller number of breakages but a constant breakage has from time to time resulted in the almost total destruction of these lamps besides which they lasted very poorly the breakage of carbons from the current alone was although small as compared with the other source of breakage still greatly in excess of the 16 candle lamps we have therefore concluded that the 32 candle lamps are not a success. This has resulted in Hopkinson recommending to the Company the adoption of some form of arc light to be worked in connection with our system. I argued against this and successfully (in so far as the immediate adoption is concerned) but Hopkinson was vested permission

to experiment with the arc light for the purpose of producing something of a practical character for this purpose. I take the ground that we had much better devote our time and money to encourage you to produce a high candle power incandescent lamp rather than to finding a suitable arc light. I am sure you ought to give this matter your immediate and careful attention. I am reliably informed that Swan is able to produce lamps from 60 to 100 candles which are very economical and which last anywhere from 600 to 1000 hours. From what I know of his other lamps I must confess that I am inclined to accept this statement as true. There is no doubt that he will receive a recognition from the Jury of the Palace for superior economy and length of life. I am of course endeavouring to persuade the Jury that what is of the greatest moment is a lamp which will have all the factors of the problem including high resistance and which shall give 16 candles of light with the greatest economy. On the other hand there is no doubt but that you will receive ample recognition of the superior comprehensiveness of your System of Electric Lighting. Of course this is all conjecture in large part because we cannot know what is in the minds of the Jury. Young Sprague is an enthusiastic advocate of everything that is Edisonian but he is only one of many and though he has done very good work so far and will no doubt continue to do so I think he will be sat upon by the English portion of the Jury to a very considerable extent. However he has insisted upon a number of tests of Dynamos, lamps &c which can only result in a recognition of your superiority.

Parliamentary Committee. The jealousies which

of course the 32 are not so good as the 16. They were made by hand, when we are rigged up the 32 50 & 200 candle power lamps will be just as good as the 16

we all feel to be inevitable have resulted in the putting of Bramwell, Spottiswoode and Siemens in the witness box before allowing me to go on and we have now received an intimation from the Committee that we have been sufficiently heard. This has raised a commotion amongst our own people and they have intimated to one or two of the Committee who are favorably disposed towards our enterprise that in common justice we must be allowed to put our witness in so that tomorrow (Monday) the intimation of the Chairman will be met with a plea for permission to put me in as our least witness. We have been rather done in this matter by the other concerns but if I get in tomorrow as I think is altogether likely I will make it hot for friend Siemens on a few points at all events. For instance he testified that it would cost £100,000 to light a quarter of a mile square of a compactly built portion of the City. My figures show that I can light a mile square for the same money. Siemen's testimony all through shows clearly that his figures and facts are based entirely upon his own devises and Swan's lamp. My figures shall show the cost upon your devises and your lamp. The result of this will be that Siemon and Swan will stand in respect of you as one to four which is in fact their proper relation. I have so pointedly brought this out that our Board of Directors will be represented tomorrow in the Committee Room and insist on my being heard thus we will be turning the tables on our friends in a way that will not be to their liking. (I have been on - & had a good shot.

Now here is a little matter in connection with

~~you will get results Yours RG~~

7

this Committee which is rather important and I would like you to cable me a few words indicative of the course you would like me to pursue in respect to it. It is this. Puleston is a member of this Committee. Painter gave me a letter to him when I came to England in 1879. I never presented it. When I came this time I received an intimation he would like to see me but I avoided it. However on the occasion of the opening of the Pullman train on the Brighton Road. I being a guest met Mr Puleston face to face and then and there learned from him that you were his debtor on old automatic account to the tune of £2000. and that further in a personal interview with you in New York or Menlo Park you unequivocally recognized this claim and promised him that you would do something for him to enable him to recoup himself. He then intimated to me that he expected I would take such a course as would enable him to wipe out this debt. Now I could not do anything for him in connection with the organization of this Company for the reason he is not tarred with the same stick as are the men who organized our English Company, consequently I was compelled to avoid him which I successfully did until the meeting of this Committee where I am now brought face to face with him for a second time in a way which leaves me no alternative but to deal with his case. After several personal intimations that he was ready to serve me and my interests on the Committee in every way in his power ~~He~~ finally sends me this letter "My dear Mr Johnson. Will you do me a personal favor. I mentioned to you incidentally some time ago an old

transaction with Mr Edison. He knows all about it. The amount (£2000) with interest at 5% which I am entitled would be roundly £3000. When I saw him in America he fully and unequivocally recognized the obligation and agreed to pay it as soon as he was able to do so telling me at the same time of his interest in Companies in New York and here which he expected would put him in funds and that it would be most gratifying to him to pay what I referred to. I think he will say that I have behaved in all respects with forbearance and that I have avoided giving him any trouble. Well you cable to him in your own way at my expense, and ask him to send the money in a personal way or authorize you to pay it to me. If you do this when this reaches you I shall be very much obliged but if you do not wish to do it then alright for I have no right to trespass on you individually about it if on the other hand you will get this for Mr I shall be very greatly your debtor

Yours faithfully"

Now my dear fellow you see the position. Of course I see the bearing of all this and I know further your views as to your individual responsibility for this account and you must know that the men who constitute our Company are of such character that I cannot obtain from them any direct recognition of this claim at such a moment. I propose to see Sir John Lubbock who is a most practical man in my opinion on our Board, to lay the whole history of this transaction before him

and to ascertain whether or not he is willing to act in conjunction with you in some way to effect a compromise of this matter I will cable you the result of my conference with him so that you may be guided on the receipt of this letter in your instructions to me. This case has unfortunately a precedent. You will remember that Ponder presented to Gourand his claim for a like amount (£2000) and Gourand was compelled to compromise it with him in order to put his Oriental Telephone Scheme through. You consented to that adjustment and you paid £1000 or rather your interest paid £1000 while Gourand managed that the Hubbard interest should pay the other. I presume that Pulcston has in some way got wind of this and sees now an opportunity of getting a settlement of his claim. What I want to know is, whether you will allow me to do with this matter what Gourand has done in respect to Ponder providing that I am able to get your friends here to join with you so as to limit your individual liability to the £500 which you paid for the Ponder settlement. It is not altogether an unjust claim because as you well know they are actually out of pocket that amount of money. I know of course that you are not in pocket but then on the other hand it is your name which stands opposite this debt whether justly or unjustly and if this obligation can be wiped off from time to time in this way it will be a very great advantage to you. It is not a very nice thing to have people going about with a claim against you in their pockets. I personally paid £50 which was my per centage of the £1000 that your interest paid Ponder and

am equally willing to stand my share of whatever you do in this matter. Preston is in Parliament the leader of a certain clique which may be manipulated for or against us. Beyond that I say nothing.

Telephone. As you will probably observe from the press there has been an abnormal excitement on the Stock Exchange over Electrical matters of all kinds. United Telephone Stock has been selling as high as £18/2 per share. Oriental was up to nearly 100 premium that is 20/- upon which but 10/- had been paid. They have now fallen off again but they may at any moment rise. Batchelor and I have been pushing Gouraud to get possession of our shares so that we might take advantage of the condition of the market and dispose of them but unfortunately we can get no quotation for them as they are Deferred shares. However they are Deferred only by the lapse of time and not by virtue of any earnings to be had and as two years of that time has already passed they will become of par value with the "A" shares in three years. This fact together with the fact that they are not subject to call as the "A" shares are renders them very nearly on a par value with the "A" shares. I am therefore seeking through Arthur Anderson to find a purchaser for Batchelors shares and my own and we will sell if we can get a bid of even 10/- I mention this to you in order that you may instruct me in respect of your own shares. Do you wish to sell on the same basis as Batchelor and I will. My advice is to do so. The Oriental Company is one which in my judgment will be many a long year in earning any dividends so that I think that the value of these shares is in reality

nil and that it would be wise to sell them at any fictitious value the present excitement may give them. This is the view of Anderson and others competent to judge. Advise me on this point.

Telephone Trial. Husbands Edmd & Co. have worked with a vigour in this matter which has been fruitful of disastrous results to you. The Judgment of the Court was in effect that the Bell Telephone Patent is good; that the Edison Telephone Patent is good as against all infringers whether the infringement by Microphone or what not but that the Patent itself is bad because of the insufficient description of the Phonograph in the Provisional Specification. Sir Frederick Bramwell says that the Master of the Rolls before whom this would ~~come~~ go on Appeal would upset this ~~Appeal~~ decision in short order. But we are to have a conference on this question of further disclaimer which I understand we can now make the question being whether or not we should disclaim the Phonograph. I am of the opinion myself that it would not be wise to do so for the reason that the Patent has been so much disclaimed already that it is an open question whether or not if it is further disclaimed that the Higher Court will not hold that the Patent is ~~not~~ altogether bad. I think it better that we should take the matter to a Higher Court as it now stands and rely upon a wiser construction of the Provisional Specification and I think it not unlikely that this is the course that will be decided upon. Be that as it may there is this satisfaction to you that 2 Judges have now decided that the Microphone is an infringement of your Carbon Telephone Patent though the invalidity of

the Patent itself if it should stand will permit anyone to use Carbon Telephones of every character including your own lamp black button. The United Company will immediately appeal and the case will be brought quickly to trial before the Master of the Rolls and it is not improbable his decision will be had before I return to America so much for Telephones (The United Co has decided to number appeal E H J

Electric Light. We have been in communication for some time past with various people who desire to contract for licenses for Districts. The Manchester concern was brought to a head yesterday and the papers will in all probability be signed tomorrow. The last difficulty they raised was the impossibility of getting any machinery to go on with for the next six months I met this difficulty by charging it had no right of existence, that you had not been heard from as to when you can deliver any of these things and that in my opinion you are able to deliver them within as many weeks as they held it would be months before you could do so. I therefore cabled you and received your reply which upset this point and enabled the finality to be reached. Therefore we shall have coming out this week an Edison Electric Light Company for Lancashire. In addition to this there will be in all probability be brought out two Companies for London one for the South Western District and one for the West Central. The South Western District will in all probability be brought out by Sir John Lubbock Lord Anson and a few others. There is a great eagerness everywhere prevalent for Edison Companies and I am of the opinion that you will see as much excitement over these Companies as has been developed during

have been signed Money paid down to show good faith 5000 £. Co. Come out Friday E H J

the past fortnight over the various Brush Companies. These latter have been commanding extraordinary premiums £10 shares selling as high as £60. The absurdity of this must be apparent to you. I have pointed it out to several here and have been met invariably with the rejoinder "Yes we all know this but people are determined to have Electric Light shares and since you are not before them they are compelled to take what they consider the next best." Our people have recognized the situation and have held Board meetings every day during this past week the result being that we shall commence floating public Companies early this week. I will cable you as to the results. Two or three of us (Batchelor White and myself) have determined that we will take a few shares in each one of these concerns and make a little something if they go to a premium. I have been offered £1250 for 100 "A" shares in the Parent Company. I paid £500 for them so this means 150 per cent premium; of course I declined the offer as I firmly believe these shares will go to an enormous premium the moment we have successfully launched two or three Companies I am however considering the advisability of selling some B shares so soon as we have succeeded with two or three District Companies and if you care to sell a number of yours I will undertake to obtain for you the best price possible. These shares have not as yet been divided. I understand that Drexel Morgan & Co. desire that they shall be issued to them. I think it only fair that they should be issued here directly to the several parties in interest that is to say that Drexel Morgan & Co. shall direct the Company here to issue in the names of the several owners instead of issuing to them and dividing hereafter. At all events

a certain number of yours Batchelors, and my own right in justice to us be placed immediately in our hands so that we may deal with them as we may see fit. Will you consult Fabbri about this I am having him called accordingly. There are 20,000 A Shares and 10,000 B Shares. These 10,000 B Shares are all that we will receive unless an additional call is made on the A Shares in which case we will receive another 10,000 B Shares. As this call is very unlikely to be made in view of the fact that our District Companies will bring into the Treasury a very large surplus and that the Parent Company itself will not make any large expenditures I anticipate that our 10,000 B Shares will represent our entire holding. In this case they will rank in respect to dividend earnings equal to two A Shares after the £20,000 has been paid and 5 Per Cent has been paid on the capital; that is to say when the £20,000 has been paid and 5 Per Cent has been paid on the Capital of those shares yet remain say £40,000 to divide, £20,000 of this would go to 10,000 B Shares and £20,000 of it to 20,000 A Shares. Thus one B Share would receive as much as two A Shares. Now take this fact in conjunction with the other fact that the B Shares are not subject to call while the A Shares are, you can see that but for the other viz: that B Shares are an awkward marketable commodity they would rank on a par at least with A Shares. Now since I have been offered 150 Per Cent upon my A Shares I think it not improbable that I may get 200 Per Cent premium or say £30 Per Share for my B Shares so soon as we have effected one or two local organizations. If I can do this I propose to sell

100 Shares. Batchelor proposes to sell a like amount: do you care to sell any and if so how many. You see the time is coming when we can realize a little on all these various things and I want to do for you whatever you desire though of course I do not want to urge upon you transaction of any kind. My own belief is that the ultimate value of these shares will be greater even than the wildest value we cared now fix. The British Electric Light Company (The Duke of Sutherland's concern) have practically accepted our proposition to grant them a license to manufacture their lamp upon their paying to us a Royalty of 6d per lamp. As this is upon the Lane-Fox Lamp we consider it important since it gives us a lever as against the Brush Company which operates the same lamp and which is our real formidable opponent in public opinion. Swan is bringing out a big Company with Forbes (The London Chatham & Dover Railway King) Brand of the United Company and others on the Board. Sir William Thompson however informs me and we have it from other sources as well that this Company will not be unfavorably disposed to the proposition to take out a license under us so that it is probable that we may not bring suit at present against them but shall confine our attention to the Brush Company. All this matter however is in a very embryo condition and you must not make public anything I have said herein concerning it. Of this you can be assured however our people have determined to force a recognition of our right to the incandescent lamp. The capitulation of the British Company is but the first step. There will be a surrender all along the

line or the biggest Patent fight you ever heard of. Our experts continue of the opinion that your lamp Patent is good without disclaimer which puts it in a very different position to the Telephone Patent which was disclaimed twice to the time of throwing out 28 claims in 30. Handford is trying his hand on drawing up a Patent on my new lamp socket and it has shown that he is quite competent to handle these affairs in a way that will render them free from any of the criticisms which have been passed upon your Patents, and by the way what do you think of the last production of Bergmann on this socket? everybody here is so well pleased with it that they want to use no other but I have persuaded them to take a certain Percentage (1/3rd) of the stock that Bergmann has already in hand they may be used for second class work Batchelor is very much pleased with it and will manufacture it and it only he has taken the model which Bergmann sent to me and he is already preparing the tools for it he will Patent it in France for his own concern I have allowed the company here to take out their own Patent of course without any payment to me and have presented the thing to Batchelor for the common good

The indications are that the materials which you are now constructing for us will be absorbed by your local organizations before it is delivered and that additional orders will have to be sent to you ere our first manufacturing concern can be got into practical operation. We were all very much pleased at the receipt of your telegram saying that you would give these new machines a normal capacity of 1400

lamps. This enables me to justify your price which was otherwise considered rather a high figure. Your cable asking if there was any objection to making the 100 light Dynamos 16 candle B's was fully considered and we decided that the gain would not compensate for the disadvantage of having two standards we much prefer the one standard of 110 volts inasmuch as with that machine we can use the present lamp as well as the 16 candle B while with a 55 volt machine we could only use one character of lamp. I therefore cabled you that we preferred the 110 Patent. I have telegraphed you for some lamps of high economy and hope you will lose no time in getting them here. I have received private intimation that Swan's lamp (the latest) will show a vast deal higher economy than ours unless we can produce some of our latest pattern to present to the Jury for test. There is another thing I would like to mention & that is the tendency on your part to ignore matters of taste. It may be very well for Mills and inferior places; at all events in this country beauty of design and proportion and finish is a power and has a very important effect on the minds of people. I would suggest therefore that you finish the Dynamos a little better at the ends than are the present ones and that you give some attention to the lamp so as to make it present when combined with the socket a compact neat appearance. At present it does not go low enough into the socket and the ~~[illegible]~~ protrusion spoils its symmetry. It seems to me this might be shortened and a little better finish given to the plaster shoulder so that when bound

with my new socket especially the whole thing would be ornamental as well as practical. This is a consideration which will have to be dealt with sooner or later and we may as well give it attention while Public opinion is on the subject and not leave it until their minds have passed to something else.

Colonial. After much delay and tribulation Gouraud succeeded in getting together a Board for his Colonial Companies consisting of some very strong people. All the terms were agreed to except the clause relating to improvements. Great importance is attached to this Clause by every one here now because as they say your reputation has attained that proportion where everyone expects that you yourself will effect such improvements as practically to disqualify your own existing methods and that if they are not in a position to acquire these improvements the enormous sums of money which they are asked to pay will have been practically thrown away. This is one of the prices you have to pay for your genius. You are not looked upon as an ordinary inventor who having made one invention (say the Magnetic Telephone) is content to lay back on his oars and let other people develope the thing but you are known to be still a fruitful worker in the field and it is quite expected of you that you will go on making such rapid strides that what is purchased to day may by virtue of your own subsequent invention be rendered practically useless tomorrow. I quite understood that you did not want to sell your future and therefore thought this hard but was compelled to ask you to accord

your improvements for at least five years. Your acceptance of these terms closed the matter and Gouraud's Company would have been formed but for the unfortunate appearance of the enclosed prospectus. You will notice that prominently displayed on this Prospectus are two names which at the present moment are uppermost in the minds of the investing public (Brush and Edison), and there is not that clear distinction drawn as to how these two names come to appear upon the one prospectus which would convey to the casual reader a clear ~~distinction~~ separation. The result has been that the juxtaposition has created the impression that you and Brush are disposed to affiliate with each other thus you can readily understand created the suspicion that there was some game going on behind the scenes looking to a consolidation between you and Brush and these people of Gouraud's would accept no explanation but demanded either that the name be withdrawn or that they be allowed to withdraw from any further negotiations. This was a direct slap in the face and would have materially affected our other Edison Companies if it had been allowed to stand. Gouraud came to me with all this and fulc with excitement and demanded to know what was to be done I said there is but one course to pursue viz to ask Edison whether is name was there by his authority. A cable was therefore sent. Your response came promptly and I appeared at a Conference between Gouraud and his people the next morning with it. Result was that two of Gouraud's people immediately ~~rose~~ left the room went to Husbands office in conjuction

with some of their other friends withdrew their names from his Company and were followed by Arthur Anderson (the Broker for Husbands affair) thus completely upsetting Husbands scheme but saving you now for matters were then arranged satisfactorily and it is expected will be finally closed tomorrow. The sequel of this days work was a visit to me from Husband as pale as a ghost in which he besought me with tears in his eyes to ask you to allow the name to stand saying that he placed it there out of compliment to you and in entire good faith never dreaming it would be read as it evidently had been as placing you in the position of a Consulting Electrician to a Brush Company. I called his attention to two or three things which I think were rather bitter for him to swallow in the first place I reminded him that he came here and voluntarily joined Eldred and crowd in their assault upon your Telephone Patent that he himself assured me a number of times that he (Husband) was the brains of that concern and was going to make it hot for the United Telephone Company and that further he during the trial was very cockish and wanted to bet me two to one that he would break down your Patent I further reminded him that I had told him that while you and I care nothing for the Telephone from a technical point of view it was of importance to you to sustain the Patent because of its Reflex action on that which we at the present moment have in the market (the Electric Light) and that if he succeeded in breaking down the Telephone Patent he would deal you a very

serious blow I further called his attention to the fact that during all this time he never considered you for a moment. He was considering himself and himself only and his conscience not only did not trouble him but that he was rather gleeful over the power that he possessed and that further only twenty four hours before his visit to me he and his friends were in high glee over the decision of the Judge invalidating the Edison Patent. I then remarked that since he himself had let loose the dogs of war he must not complain of the consequence. He then began to appeal to me personally pleading his wife and children and all that and saying that he was utterly ruined unless in the next twenty four hours I could have you recall your cable I gave him distinctly to understand that it was a case of the failure of your first public Company and therefore a serious blow to all subsequent ones or a failure of his (Husbands) Company i e a Brush affair and I asked him if he seriously thought that you ought to be asked to consider him first and you and your associates last He saw the point but was in great distress and wanted me to give him my advice

I pitied the fellows although he deserved none and I advised him to go to the people with whom he had been negotiating and who were negotiating with Gouraud and try and prevail upon them to accept your telegram as sufficient for themselves and then to ask you to allow of the use of your name so altered in its appearance on their prospectus as would clearly distinguish it from Electric Light matters and apply it only to Telephonic matters. This was last night [Saturday] since which time I have not seen him. It is not often that a retribution so just and so swift comes upon any one as has fallen upon these fellows, triumphant on Friday in sticking a knife into a mans ribs and prostrate on Saturday from a self inflicted but severer thrust. One thing sure you must not consent to the use of your name being associated in any way either directly or indirectly with any other Electric Light Scheme than your own. The effect on the present feverish condition of the public mind would be disastrous in the extreme. Suspicion is rife and your affairs, like Cæsar's Wife must be above suspicion, especially now as one of your Patents has received its death blow. We consider this so important that we have broken off a negotiation with a group of people who were buying from us two Districts in London paying therefore £50000 and half profits for the simple reason that the same group of people had acquired Rush Lights for the Australian Colonies. We would not consent to one ownership of the two things altho'

for Sections so remote from each other. I am sorry for Husbands, but I think you will approve of my action and my firmness in maintaining the course I pursued.

American Affairs

I have made up a little pool with Lord Arran White and Bourcrie to buy a few American shares and hold them as against the time when you shall be in full operation in New York. I should have bought a very large number of these shares had I known they were so low as they appear to have been a short time since but I unfortunately did not know it. At all events we have decided to buy 30 shares at not exceeding from 600 to 700. I have cabled Insull to do so. I believe that our profits in this Electric Light business are to come out of America and England. I have had very full and free talks with Batchelor and I am of my old opinion that no great profit will ever reach your pockets from that concern It is too complicated and in the hands of men who are themselves personally too grasping.

Yours very truly

Edw.d H. Johnson

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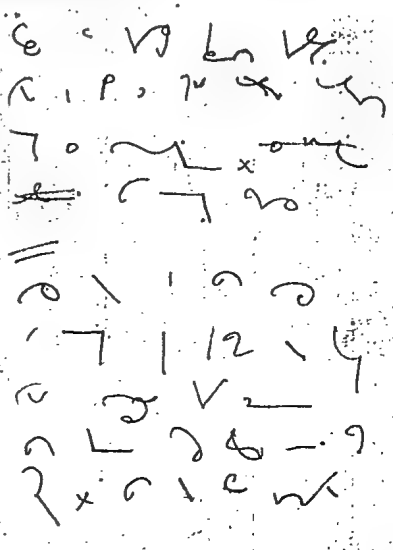
May 21.82

Johnson



3

May 27.

From WATERHOUSE & WINTERBOTHAM, Solicitors, 1, NEW COURT, CAREY STREET, LINCOLNS INN, W.C.

Waterhouse & Johnson

May 27. 1882

Dear Mr. Johnson,

Edison electric light

In reference to the Disclaimers which we have just decided must be proceeded with, by no chance or by any other chance as to any criticisms which Mr. Edison may wish to offer, you will, I hope not mind if clear in writing to him to say that the most careful

consideration has been
given by all concerned —
(Mr Webster K.C. Mr Roberts
Mr S. H. Johnson &
yourself) — to the questions
involved, & that we
are cutting away nothing
which could in the judgment
of the best qualified to
judge be with safety left.

Yours very faithfully
Hewitt Waterhouse

S H Johnson Esq
5 Holborn Hotel.

47 Lincolns Inn Fields.

London W.C. May 27th 1882

Dear Sir

At the request of Messrs. Waterhouse & Winterbotham instructed by Mr. E. H. Johnson I beg to enclose you Specs. No. 578, 1385, 3880, 3964 and 768 altered in red ink as proposed to be disclaimed. I also enclose you Mr. Shelford Bidwell's Opinion on the Disclaimers

Yrs. truly

J. Henry Johnson

J. A. Edson Esq

Menlo Park New Jersey U.S.A.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 30TH MAY, 1882

S. INSULL ESQ.,
MENLO PARK,
NEW JERSEY.
U. S. A.

DEAR MR. INSULL,

I DARESAY JOHNSON HAS TOLD YOU THAT HE HAS BOUGHT THROUGH YOU THOSE TWENTY SHARES FOR MR. BOUVERIE, LORD ANSON AND MYSELF. WOULD YOU BE SO KIND UNTIL HE GETS OUT TO POST ME ONCE OR TWICE A WEEK A BROKER'S PRICE LIST OR THE AMERICAN EQUIVALENT FOR THAT DOCUMENT. WE ARE WATCHING YOUR INSTALLATION WITH THE WARMEST INTEREST AND I TRUST IT WILL BE AS GREAT A SUCCESS AS JOHNSON'S INVINCIBLE ENERGY AND SKILL HAS MADE IT HERE.

YOURS FAITHFULLY,

Tyrrell Co

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 31ST MAY, 188

ENCLOSURE

T. A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY. U.S.A.

DEAR SIR,

ENCLOSED I BEG TO HAND YOU AN ORDER FOR MATERIALS WHICH PLEASE HAVE EXECUTED AT THE EARLIEST POSSIBLE DATE. AS THE ORDER COMPRISES THE MATERIALS IMMEDIATELY WANTED FOR STOCK, THE COMPANY WILL EXPECT TO RECEIVE THE LATEST STYLE OF FITTINGS AND THE NEWEST DESIGNS. AS THE QUESTION OF ORDERING ENGLISH OR AMERICAN HARDWARE GOODS IS NOW OCCUPYING THE ATTENTION OF THE BOARD, THE DIRECTORS TRUST THAT THE PRICES QUOTED WILL BE SUCH AS TO ENABLE THEM TO CONTINUE TO PLACE THEIR ORDERS WITH MESSRS BERGMANN.

WHEN ANYTHING SPECIAL IN DESIGN OR STYLE IS BROUGHT OUT, I WOULD SUGGEST THAT A SAMPLE BE SENT TO THE COMPANY, AS IS THE USE AND WONT OF ENGLISH FIRMS.

YOURS TRULY,

SECRETARY

A List of Applications for Shares, accompanied by the deposit of £1 per share, will be opened by the Manchester and County Bank Limited, King Street, Manchester, on Thursday, the 25th May, 1882, and will be closed on or before Wednesday, the 31st May, at three o'clock p.m.

Prospectus

OF THE

MANCHESTER AND DISTRICT EDISON ELECTRIC LIGHT COMPANY LIMITED.

Registered under the Companies Acts, 1862 to 1880, as a Company Limited by Shares.

Capital £600,000 sterling, in 60,000 Shares of £10 each, divided into 50,000 A Shares, and 10,000 B Shares.

First issue, 20,000 A Shares and 10,000 B Shares.
£1 to be paid on Application, and
£1 on Allotment.

Directors.

V. K. ARMITAGE, Esq., Crimble Hall, Rochdale.
EDWARD CROSS, Esq., Bradford House, Bolton.
JOSEPH C. LEE, Esq. (Tootal Broadhurst & Lee), Mosley Street, Manchester.
WILLIAM MATHER, Esq., Salford Ironworks.
CHARLES MOSELEY, Esq., Victoria Park, Manchester.
WILLIAM A. TURNER, Esq. (Wright Turner & Son), Kingston Mills, Pendleton.
I. CREWDSON WATERHOUSE, Esq., Portland Street, Manchester.

Bankers.

MANCHESTER AND COUNTY BANK LIMITED.

Solicitors.

Messrs. NEEDHAM, PARKINSON, & SLACK, 10, York Street, Manchester.

Secretary *(pro tem.)*.

Mr. ERNEST CREWDSON, 5, Norfolk Street, Manchester.

Temporary Offices.

5, NORFOLK STREET, MANCHESTER.

Objects.

THIS Company is formed for the purpose of acquiring licences and powers to use within the area of their district all the patents of Thomas Alva Edison relating to the production and supply of electricity as a lighting, heating, and motive agent, except for the purpose of locomotion on Railways or Tramways, or on Common Roads only, or for the purpose of lighting ships and railway trains.

District.

The district, the monopoly of which is secured to the Company, includes the whole of the County of Lancaster, except the South-west Parliamentary Division, and that part of the county which lies North and North-west of Morecambe Bay; it also includes the border towns of Staleybridge, Dukinfield, Hyde, Stockport, and Todmorden.

The following towns are comprised within this boundary:—

Accrington,	Eccles	Oldham
Ashton-under-Lyne	Farnworth	Oswaldtwistle
Bacup	Fleetwood	Over Darwen
Blackburn	Great Harwood	Padiham
Blackpool	Guide Bridge	Patricroft
Bluepits	Haslingden	Preston
Bolton	Horwich	Rawtenstall
Burnley	Heywood	Ramsbottom
Bury	Hyde	Rochdale
Carnforth	Kirkham	Radcliffe
Clitheroe	Kearsley	Saddleworth
Colne	Lancaster	Salford
Chorley	Little Hulton	Staleybridge
Church	Lytham	Stockport
Clayton-le-Moors	Manchester	Todmorden
Denton	Morecambe	Whalley
Droylsden	Mossley	
Dukinfield	Newchurch	

Licence comprises all Edison's patent.

The Company will therefore be the sole licensees for this district of all Mr. Edison's patents for electric light and power, except as above-mentioned.

The Incandescent Lamp.

The light from the Edison Incandescent Lamp is produced by the electric current being passed through a carbon filament or thread of high resistance fixed in a glass bulb or shade from which the air has been exhausted. There is no consumption of carbon and no vitiation of air. If broken though enveloped in the folds of muslin the light is harmlessly and instantaneously extinguished. Each light is controlled by a tap, singly or in groups. The light is of a pure and soft colour, is not fatiguing to the eye, and gives out less than one-fifteenth of the heat of gas, and is absolutely steady. According to the opinion of eminent counsel Mr. Edison, under his patents, has the sole right to manufacture and sell the Incandescent Lamp, consisting of a carbon filament in a vacuum, under whatever name that lamp may be known.

Operations of Company.

Company can deal with Corporations.

The operations of the Company will include the lighting by contract of houses, manufactories, public buildings, streets, towns, docks, mines, &c., and the application of electricity to all purposes, except as before mentioned. The Company will be enabled to deal with municipal corporations and other local authorities, and make arrangements with them for lighting the district, or supplying electricity for any other purpose within the powers of the Company.

And grant concessions.

It is intended to grant concessions to local Companies to be formed for establishing and working the system in any of the towns within the district.

The Edison system of lighting.

The Edison system of Electric Lighting, the details of which are protected by the thirty-nine patents, which are included in the agreement with this Company, is as a whole (including all operations and processes from the generation of electricity to the registration of the quantity used by the consumer) considered by the highest authorities to be the most successful and effective which has hitherto been produced. The

electric pressure is not sufficient to inconvenience anyone grasping the electric main wires, whilst with most other machines in use instant death would be the result of such an action.

By this system the risk of fire is reduced to a minimum, and this, it is hoped, will lead to a general reduction in the rates of insurance against fire charged to the occupiers of premises lit by the Edison Electric Light. **Immunity from risk of fire.**

As an example of the work which can be done it may be mentioned that, at the present time, the Holborn Viaduct, and the houses and shops on each side, including the London, Chatham, and Dover Railway Station, Messrs. Spiers and Pond's Hotel, and the City Temple, are now lighted by the Edison Electric Light Company Limited according to the Edison system, and all the lamps (about 938) used for this purpose are supplied by a single Edison dynamo placed in a central position.

The most important feature in a system of electric lighting is the equal, continued, and steady distribution of the electric current, and in this respect Mr. Edison's system far surpasses the other systems which have been developed. There is, doubtless, a great future for this system in supplying electricity from a central station to houses and works, where it can be used for lighting purposes or for a motive power. **Steady distribution.**

The consideration to be paid to the Edison Electric Light Company Limited is the sum of £50,000, to be paid as follows:—£25,000 on the granting of the licence, and £25,000 in six months, and the allotment to the Edison Electric Light Company Limited of the 10,000 B Shares as fully paid up. The last-mentioned sum of £25,000 is to be taken by the Edison Electric Light Company Limited in anticipation of profits on one-half the B Shares as hereinafter mentioned. **Purchase money.**

The profits of the Company will be first applied in the payment of a preferential cumulative dividend at the rate of £5 per cent per annum on the amount paid or credited as paid on the A Shares. One-half of the remainder of such profits will be applied in payment of further dividend on the A Shares, and the remaining half will be divided amongst the B Shares. **Division of profits.**

The agreement with the Edison Electric Light Company Limited provides that no dividend will be paid on one-half of the B Shares until the dividends which would otherwise have been payable in respect thereof shall amount to £25,000 with interest at 5 per cent. **Abatement of dividend on B shares.**

The only Agreement affecting the Company which has been entered into is one dated the 22nd of May, 1882, made between the Edison Electric Light Company Limited of the first part, and William Mather and others of the second part. **Agreement.**

The Agreement provides for the grant of the licence directly from the Edison Electric Light Company Limited to this Company. No profit is made by any intermediate parties.

Copies of the Agreement and Memorandum and Articles of Association may be inspected at the offices of the Solicitors and Secretary.

If no shares are allotted to any applicant the amount paid as deposit on application shall forthwith be returned to him without interest.

More than half the capital required has already been applied for by the Directors and their friends.

Prospectuses and Forms of Application for Shares can be obtained, and further particulars and information will be furnished on application to the Secretary, 5, Norfolk Street, Manchester.

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The Manchester and District

EDISON ELECTRIC LIGHT COMPANY

LIMITED.

Prospectus.

TEMPORARY OFFICES:

5, NORFOLK STREET,

MANCHESTER.

Memorandum of Association

OF THE

MANCHESTER AND DISTRICT EDISON ELECTRIC LIGHT COMPANY LIMITED.

I. The name of the Company is "THE MANCHESTER AND DISTRICT EDISON ELECTRIC LIGHT COMPANY LIMITED."

II. The Registered Office of the Company will be situate in England.

III. The objects for which the Company is established are:—

1. To adopt and carry into effect an Agreement, dated the 22nd day of May, 1882, and made between THE EDISON ELECTRIC LIGHT COMPANY LIMITED of the first part; and WILLIAM MATHER and others, whose names are thereto attached, of the second part (a copy of which is set out in the Schedule to the Articles of Association registered herewith), subject to any modifications which may hereafter be agreed upon.

2. To acquire by purchase or otherwise licences of any description to use in and over the area of the County of Lancaster, and the present municipal boundaries of the towns of Staleybridge, Dukinfield, Hyde, Stockport, and Todmorden, whether within such county or not, but excepting the South-west Parliamentary Division of such county and excepting such portion of the county as lies North and North-west of Morecambe Bay (which area is hereinafter called the district), or elsewhere the several patents specified in the schedule to the before-mentioned agreement or any other Patents taken out or to be taken out for the United Kingdom by Thomas Alva Edison, or on his behalf in relation to the application of electricity or magnetism as a lighting, heating, and motive agent.

3. To acquire by purchase or otherwise any additional letters patent, rights, or monopoly relating to the inventions the subject of the letters patent mentioned in the said Agreement, or any inventions of a like character, or relating to any other business the Company is authorised to carry on, or any interest therein upon any terms, and to take and work any licence or licences in connection with any such invention.

4. To do, or concur, or join in doing all such things (including applications for amendment or disclaimer) as may be deemed expedient for using, developing, and otherwise obtaining the full benefit of the patents and inventions for the time being belonging to the Company, or in which it is interested, with full power to grant licences for the use thereof, on such terms, and for such consideration as may be agreed upon, and to manufacture, sell, and let apparatus for the application of the said inventions, and to acquire or to establish, and to carry on any business or businesses which can be carried on in connection with any of the operations of the Company.

5. To acquire the goodwill of, or any interest in, any trade or business, similar or analogous to any trade or business which the Company is authorised to carry on.

6. To acquire and work all necessary machinery, materials, and things, and to acquire by lease, purchase, or otherwise, any land or buildings, or to erect any buildings for any of the purposes of the Company.

7. To sell, improve, develop, manage, work, maintain, let, mortgage, or otherwise deal with and dispose of, all or any part of the business, property, and rights of the Company, in such manner, on such terms, and for such purposes as the Company may think proper.

8. To obtain and pay out of Capital the expenses of obtaining any Act of Parliament or any Provisional Order, licence, or authority of the Board of Trade, or any Municipal or other Corporation for enabling the Company to carry all or any of its objects into effect.

9. To unite, co-operate, or amalgamate with any persons or any Company hereafter to be established for, or already engaged in, objects similar or analogous to those of the Company and to acquire, for the benefit of the Company, and in the name of the Company, or otherwise all or any of the Shares, or Stock, or any other interest in any such Company, and to promote the formation of any such Company.

10. To do all such other things as are incidental or conducive to the attainment of the above objects.

11. To pay to the parties of the second part of the said Agreement the sum of £5,000 paid by them to the EDISON ELECTRIC LIGHT COMPANY LIMITED as a deposit on the signing thereof, together with interest thereon at the rate of £5 per cent per annum from the time of payment thereof until the time of repayment.

IV. The liability of the Members is limited.

V. The Capital of the Company is £600,000, divided into 50,000 A Shares of £10 each, and 10,000 B Shares of £10 each, with power to increase the Capital by the issue of further A Shares. The B Shares are to be allotted as fully paid-up under the said Agreement of the 22nd day of May, 1882.

APPLICATION FORM.

The Manchester and District Edison Electric Light Company Limited.

To the Directors,

Gentlemen,

Having paid into the MANCHESTER AND COUNTY BANK LIMITED, to the credit of the Manchester and District Edison Electric Light Company Limited, the sum of £_____; being a deposit of £1 per Share on_____Shares of £10 each in the Company, I request you to allot me that number of Shares, and I hereby agree to accept the same, or any smaller number that may be allotted to me, and to pay the sum of £1 per Share on Allotment, as provided by the Prospectus; and I authorise you to cause me to be registered as holder of the said Shares accordingly.

*Name (in full)*_____

*Address and Occupation*_____

*Date*_____

*Signature*_____

This Form to be sent entire to the Manchester and County Bank Limited, King Street, Manchester.

The Manchester and District Edison Electric Light Company Limited.

BANKERS' RECEIPT.

Received *the*_____*day of*_____*1882, of Mr.*_____*the sum of*_____*Pounds, being a deposit of One Pound per Share upon*_____*Shares in the Manchester and District Edison Electric Light Company Limited.*

STAMP.

£____ : : ____

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 6th June, 1882.

Samuel Insull, Esq:-
65, Fifth Avenue,
New York, U.S.A.

My dear Sir,

Electro Dynamic Company of Philadelphia.

I beg to acknowledge receipt of your letter of 25th May, enclosing full particulars regarding the above Company.

Pray accept my best thanks for your trouble in this matter, and believe me

My dear Sir,

Yours truly,

C. Mola White

Secretary

9

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C., June 7 1882

Thomas A Edison Esq
My Dear Sir

I received a letter the other day from Geo. stating that he now uses a solution of less density than our first one, with some of the results he got. I tried the experiment and get about the same results. The enclosed chart of which a duplicate I have sent to Geo. shows the variations and speaks for itself. Our constant is there for changed, and instead of being 1.336 is 1.439 which is the amount of deposit every weber will produce,

The meters here on the Viaduct work satisfactory and they understand it now, so I shall leave for Paris on Friday this week.

Hoping you are well
I remain
Yours Sincerely
Francis Jehl

[ENCLOSURE]

To Thomas A. Edison Esq.

7th June 1882

Chart showing the variations of Resistance of Cu wire (7 ohms @ 0° Cent) and $ZnSO_4$ solution

⟵⟵ Variations of $ZnSO_4$ solution (735 parts $ZnSO_4$ to 1000 parts H_2O)

⟵⟵ Variations of Cu wire.

Curve No 1 — Shows the variations in the united circuit consisting of the $ZnSO_4$ and Cu wire.

The arrow bisecting curve No 1 shows the point of average resistance between 5° & 35 Centigrade which is 8.317 ohms

From the above data we arrive at our constant which we use in ascertaining the quantity of current that passes through a meter.

8.35
8.29
8.27
8.28
8.29
8.34
8.40

7) 58.22 — Avge Resistance
8 31.7

There are 832.7 parts of current going through the Meter

1 — part enters into the Deposition Cells
832.7

831.7 — parts go through the German Silver shunt
832.7

One Weber of Current will Deposit 1198.8 milligrams of Zinc p. hour.
Therefore the deposition cell will receive or deposit $\frac{832.7}{1}$ of 1198.8 which = 1.439

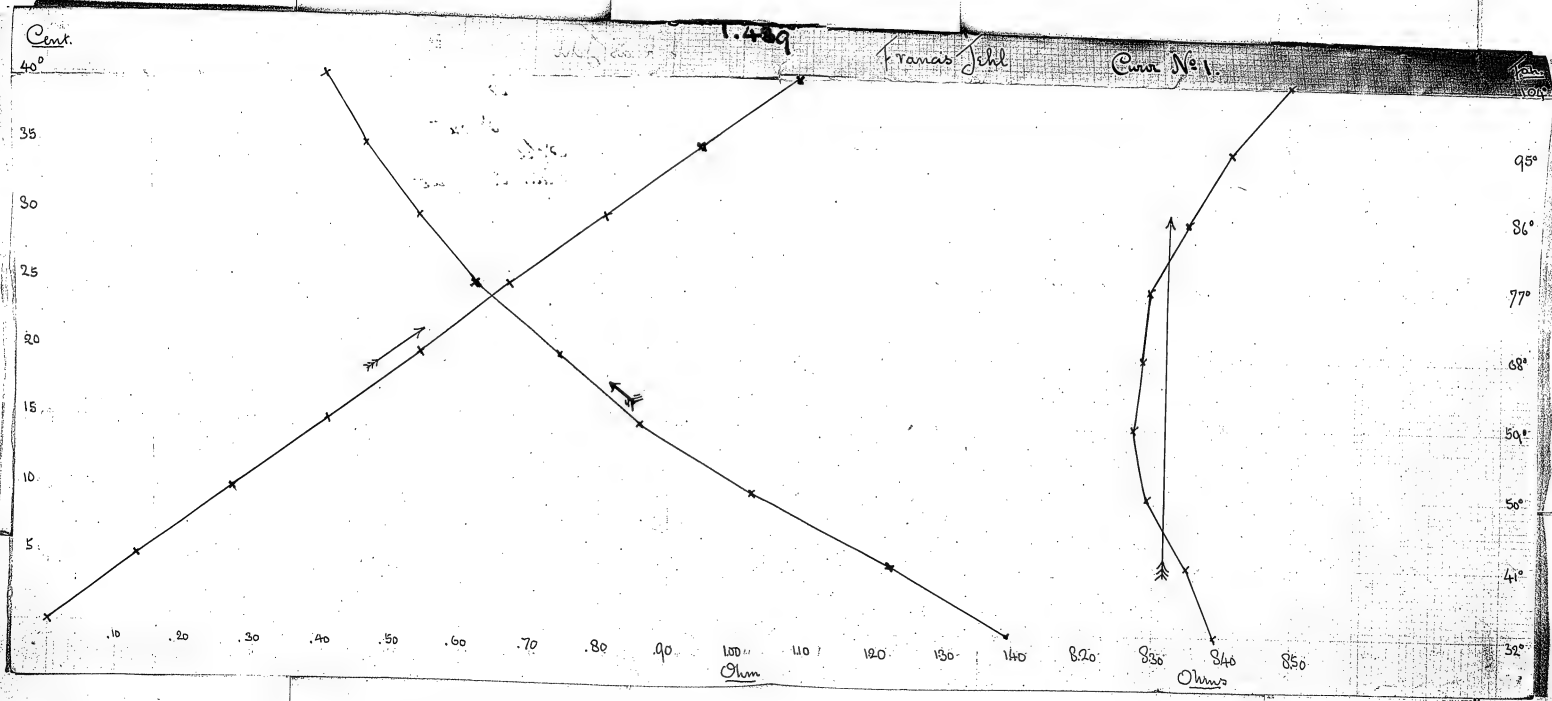
Our formula therefore becomes

$$\frac{\text{Gain in Milligrams}}{1.439} = \text{Webers per hour}$$

Francis Jehl

Curve No 1.

[ENCLOSURE]


1.489
Francis Jehl
Curv. No. 1.
Cent.
40°
35
30
25
20
15
10
5
.10
.20
.30
.40
.50
.60
.70
.80
.90
100
110
120
130
140
Ohm
820
830
840
850
Ohms
95°
86°
77°
68°
59°
50°
41°
32°

DREXEL, MORGAN & CO.
Wall St. Corner Broad.
New York.
DREXEL & CO.
Philadelphia.
DREXEL, HARJES & CO.
Paris.

New York June 10 1882

T. A. Edison Esq
Menlo Park
N.J.

Dear Sir

Having received settlement from the Edison Electric Light Co Ld of London for the £20.000. Bonus agreed upon, we have accounted to Mr E. H. Johnson for his 5%, and have credited your a/c for your share of the remaining £19.000., say 47½%, or

£9.025. @ 4.86 net = $43.861.50

Value Apr 25/82

Yours very truly
Drexel Morgan & Co
C. Ignatius

35000
6000
41000

286150 cr N. Y. P.

Dr M. P. P.
Ch Engl Light

Enclosure.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 10TH JUNE, 1882

T. A. EDISON ESQ,
MENLO PARK,
NEW JERSEY.
U. S. A.

DEAR SIR,

ENCLOSED I BEG TO HAND YOU COPY REPORT OF DR. HOPKINSON OF THE 7TH INSTANT, UPON WHICH THE DIRECTORS WILL BE GLAD TO HAVE THE BENEFIT OF YOUR VALUABLE ADVICE.

I AM, DEAR SIR,

YOURS TRULY,

Arnold White

SECRETARY.

[ENCLOSURE]

(Copy)

4 Westminster Chambers
Victoria Street S.W.
June 7th 1882.

To the Directors of the Edison Electric Light Co. Limited

Gentlemen,

(1) Referring to my Report of 1st May I set the Electric hoist to work on the evening of the 23rd and finding it satisfactory handed it over to Dr Fleming —

A motor suitable for driving a sewing Machine has been ordered from Siemens Brothers on my recommendation after seeing a similar Machine.

I have made a recommendation to the Secretary as to the Apparatus needed for the experiment in Arc lighting and understand these have been ordered

(2) I have attended the Meetings of the Select Committee on Electric Lighting and have carefully considered the Government Bill. One feature of the Bill is that it contemplates Companies supplying Electricity to be used by the Consumer as he thinks fit; the Company having but little authority over the mode of use. The Edison Company should address itself to taking advantage of this feature by proving that its supply lends itself most readily to such freedom of use and for this purpose the exhibition of motors and also of Arc lights if successful at Holborn Viaduct will be of value. Mr Slagg of Manchester has addressed many

[ENCLOSURE]

questions to witnesses evidently in the sense of shewing that local authorities are the proper persons to supply electricity. I have reason to believe that many members of the Manchester Corporation are also strongly of this opinion, if the Corporation will do this work now, it may be the best thing possible for the Edison Company as its system is practically the only one a Corporation could take up for general supply.

A great deal has been said about the conditions of supply which Electric Companies should submit to when they ask for a License or Provisional Order. It is desirable that we should carefully consider what we want and what we can undertake so that we may be ready to formulate suitable conditions. A variety of points have been raised, for example. –

(a) Should high potentials be forbidden?

(b) Should a Company be required to maintain its Mains charged day and night? –

(c) What variations from the Standard potential which a Company undertakes to maintain throughout its system are permissible?

(d) Should profits be limited?

(e) Should a limit of price to be charged be fixed? if so how should be charge be determined?

(a) As to limit of potential we have been much hampered by the interest of the Brush Company which for the time being we were bound to respect scrupulously but it is probable that in houses some limit will ultimately be fixed. When the Bill is passed and joint action ceases it will be a matter for serious consideration what limit shall we recommend?

(b) My own opinion is that Companies supplying the Public with Electricity should be required to maintain

[ENCLOSURE]

their Mains charged day and night, excepting certain specified hours set apart for convenience of testing insulation. —

(c.) We might safely I think warrant a potential within very narrow limits throughout a system and might press on the Board of Trade to require others to do so also. —

(d.) This point needs little consideration from us, it is only a question of framing arguments against limitation of profits. —

(e) The question of the mode of charging for electricity is one which should be at once considered and as far as possible a policy decided upon for anything which may be publicly said by any of us is sure to be quoted when applications are made for licenses or Provisional Orders. Our supply of Electricity differs from the supply of Gas in this. We do not propose to store it consequently Electricity must be used at the instant at which it is produced. In supplying Electricity a very material item of the cost arises from the dead charges for depreciation and interest of machinery and conductors. It will cost much more to supply electricity to a consumer who lights a thousand lamps between the hours of 6 and 7 in the evening than to a consumer who lights one hundred lamps between the hours of 6 in the evening and 4 in the morning, although they would consume the same quantity of electricity. It would seem fair that the consumer should state his maximum consumption and that the safety fuse at the entrance to his premises should be arranged to give way with a current slightly in excess of this maximum, that

[ENCLOSURE]

he should pay a fixed quarterly sum in respect of the dead expenses incurred by providing Machinery at the central Stations and Conductors capable of meeting this maximum demand without disturbing the supply to neighbouring consumers. We should make a further payment in respect of the electricity indicated by his Meter, corresponding to those expenses such as coal &c which are proportional to the current produced. Thus for illustration a consumer might be required to pay a fixed charge of 10/- per annum for each incandescent lamp which he was enabled to light and a Meter charge of one tenth of a penny for every lamp hour as indicated by his Meter, these figures are of course only for illustration the actual figures will naturally depend on local circumstances I am anxious that the question of the proper method of charging for a supply of Electricity should be considered because if a wrong system is adopted in connection with compulsion to supply the "undertakers" may have that business which they can do least profitably thrust upon them and may be refused the business which they could do to the greatest advantage —

3. It is important that some rule should be arrived at as to the best size of Conductors for conveying a given quantity of Electricity having regard to the Cost of materials and of Engine power in this Country. I should like to give some attention to this point, to do so I should be in possession of what Mr. Edison recommends to the Company and of the sizes and prices of the beautifully arranged

[ENCLOSURE]

Conductors which he supplies —

4. I have reported to your Solicitors on Edison's Patent No 4576 of 1879.

I am

Gentlemen,

Yours respectfully

(Signed) J. Hopkinson

3

Bramwell Report on high resist carbon filament

37 Great George Street.

Westminster. S. W.

12th. June 1882.

Edison's Patent 1879 No. 4576.

REPORT

of

FREDERICK BRAMWELL.

The notes as to the pages and lines of Edison's Specification in this Report refer to the second Edition of that Specification.

This patent has for title "Improvements in Electric Lamps and in the method of manufacturing the same."

I have read the specification of this Patent and also the specifications with which you have furnished me

of the prior patent of Lane Fox 1878 No. 3988.

" " " " " " " 1878 " 4043.

" " " " " " " 1878 " 4026.

and the provisional Specification of Lane Fox 1879 No. 1122.

I have also read in No. 719 of the "English Mechanic & World of Science" the reprinted abstract of the Specification of King's Patent which originally appeared in the "Mechanics Magazine" of April 25th. 1846.

I have also read the manuscript copies with which you furnished me of the Article on Ladygin and Kostoffs Electric Light in the "Engineer" of May 8th. 1874, of the Article on Mr. Day's new Electric Light in the "Engineer" of January 15th. 1875.

Of the Article on Rarpner's Electric Lamp in the "Engineer" of June 28th. 1878, and of a portion of the leading article in the "Engineer" of March 22nd. 1878 on Mr. Sawyer's Electric Lamp.

I have read also the specification of Swan's patent of 2nd. Janua ry 1880 No. 18 and the precis in the "Electrician" of the 30 th. October 1880 of Mr. Swan's lecture of the 20th. of that month.

Finally I have read the specification of Edison's prior patent of 1879 No. 2402 for

"Improvements in Electric Lights and in apparatus "for developing electric currents and regulating "the action of the same."

and I now beg leave to report as follows:

Edison. Page 1. Line 6.

The Provisional Specification of the Patent 4876 (1879) sets out by stating that "It is necessary to "practically sub-divide the electric light into a greater "number of luminous points so that lamps connected in "multiple may be employed without the necessity of using "conductors of great size for the current to the lamps. "It is essential that the lamps should be of great resis-

tance."

I should very much like to see the punctuation of the original of this Specification. I believe it will be found that there should be no full stop after "lamps" and no capital to the "It" and that the meaning of the sentence is that in order to couple up lamps in multiple without needing very large conductors the lamps must be of great resistance.

Edison. Page 1. Line 9.

The Patentee then refers to the Provisional Specification of the 17th. June of the same year 1879 No. 2402 a patent then not fully specified and says that in that Provisional specification he has set this forth and after speaking of the great resistance he has obtained with lamps having long lengths of platinum or metallic wires pyroinsulated he goes on to say that his "present "invention relates to lamps of a similar character, "except that carbon threads or strips are used in place " of metallic wires," that he uses "a block of glass "into which are sealed two platinum wires" that they "serve to convey the current to the electric lamp "within a bulb which is blown over the lamp and united "to the glass block" then he says "The bulb is exhausted "of air to about one millionth of an atmosphere" that "upon the ends of these wires are two clamps that secure "two other platinum wires" and that "the burner consists "of a filament or thread of carbon preferably coiled,

Page 1. Line 14.

"with the ends secured to the platinum wires, the whole

Page 1. Line 23. "being made as follows:" and then he instances materials suitable for the making of his filament and states that it should be wound so "as to expose the last amount of

Page 2. Line 4. "surface to radiation." then he states that "the helix "is secured to the platinum wires by plastic carbon" and that the whole is then carbonized then he says 100 ohms of resistance can be got in this manner and that

Page 2. Line 8. the high vacuum prevents the destruction of the "fragile "carbon" by oxidation then he sets forth the prior state of knowledge with respect to carbon lamps, says that what have been employed are carbon sticks having only three or four ohms of resistance that none have been used in vacuum bulbs composed entirely of glass that there was a difficulty of sealing leading wires into the glass if they were of such size as would convey a sufficient current to a lamp of this low resistance but with the 100 ohm lamp there is no difficulty.

Edison. Page 2. Line 16. Then he describes certain modes of making his carbon filaments and of securing them.

Page 2. Lines 35 & 36. At page 2 lines 35 and 36 there is an obvious misplacing of a word. It stands thus "To increase "the resistance of the lamp black tar compound I some- "times work <u>it into</u> a volatile powder such as powdered "camphor &c. &c." Obviously it should be "to increase "the resistance of the lamp black tar compound I some- "times work <u>into it</u> a volatile powder such as powdered

"camphor &c."

Coming to the final Specification it will be found that although it does not repeat the Provisional Specification in its recital clause it by no means departs from the tenor of the provisional Specification nor does it so far as I can see comprise anything that is not foreshadowed by the Provisional Specification.

The final Specification does not however allude to the Provisional Specification of the 17th. June 1879 No. 2402 referred to as already stated in the Provisional Specification of this patent No. 4576 and I shall have to allude to this omission hereafter.

Edison.
Page 3.
Line 6.

The final Specification sets out by stating that "The object of this invention is to produce electric "lamps giving light by incandescence, which lamps shall "have high resistance so as to allow of the practical "sub-division of the electric light."

Having indicated the object, the Patentee then goes on to state how by his invention he attains the object desired and in doing so he shows that the invention is divided into three branches and one sub-branch.

Page 3.
Line 10.

(1) At page 3 line 10 it is said "The invention "consists in a light giving body of carbon wire

"or sheets coiled or arranged in such manner as "to offer great resistance to the passage of the "electric current and at the same time present "but a slight surface from which radiation can take "place."

Page 3. Line 14. (2) Page 3 Line 14. "The invention further con- "sists in placing such light giving body of great "resistance in a nearly perfect vacuum to prevent "oxidation and injury to the conductor by the "atmosphere. The current is conducted into the "bulb through platina wires sealed into the glass"

Page 3. Line 19. (3) Page 3 line 19. "The invention further con- "sists in the method of manufacturing carbon con- "ductors of high resistance so as to be suitable for "giving light by incandescence" and

Page 3. Line 20. (3a) "In the manner of securing perfect contact "between the metallic conductors or leading wires and the "carbon conductor."

Then comes the Patentee's view of the state of knowledge prior to his invention and following that which he said in the provisional Specification he repeats that

Page 3. Line 23. heretofore incandescence has been obtained from rods of carbon of one to four ohms resistance placed in closed vessels, and (adding to that which he said in the provisional) he informs the reader that the air has been displaced and that these rods have been surrounded by

gasses that do not combine chemically with the carbon.

Page 3. Line 25. Then he says that the vessel containing the carbon had been composed of glass cemented with a metallic base and that the connection between the leading wires and the carbon had been obtained by clamping the carbon to the metal, that the leading wires have been large, that the attempts of previous persons have been to reduce the resistance of the carbon rod. Then he points out the objections to these various prior modes and states that the employment of a lamp of from one to four ohms of resistance would prevent their being used in multiple arc unless the main conductors were of enormous dimensions that it is difficult to keep the glass globe tight where the wires pass in and are cemented that thus the carbon would of necessity be consumed because the vacuum must be almost perfect to render the carbon stable especially when it is small in mass and high in electrical resistance.

Page 3. Line 29.

Page 3. Line 31.

Edison . Page 3. Line 36.

Page 3. Line 40. Then he states there is a difficulty in preventing the destruction of the carbon by the employment in lieu of exhaustion of any gas not uniting chemically with carbon.

Page 3. Line 44. Then he says that he has reversed the whole of the previous practice page 3 line 44 to line 48 he states "he has discovered that even a cotton thread properly "carbonized and placed in a sealed glass bulb exhausted "to one millionth of an atmosphere offers from one hun-

dred to five hundred ohms of resistance." to the passage of the current and that it is absolutely stable at very high "temperatures".

Page 3. Line 48 to 51

Line 48 to 51 he says that "if the thread be coiled "as a spiral and carbonized or if any fibrous vegetable "substance which will leave a carbon residue after heat-"ing in a closed chamber be so coiled as much as 2,000 "ohms resistance may be obtained without presenting a "radiating surface greater than 3-16 of an inch"

Page 3. Line 51 to Page 4. Line 1.

Page 3 line 51 to page 4 line 1 that he can vary the resistance of the fibrous material by rubbing it with a plastic compound of lamp black and tar.

Page 4. Line 1 to 8

Page 4 line 1 to line 8 he describes a mode of making his carbon filament by a combination of tar and previously ignited lamp black kneaded to a putty and then he says it may be rolled out as a wire a small as 7-1000 of an inch in diameter that this wire may be coated with a non-conducting non-carbonizable substance and wound on a bobbin or as a spiral and the tar be carbonized in a closed chamber by subjecting it to a high heat.

Page 4 Lines 9 to 12.

At page 4 line 9 to 12 he says that he sometimes puts a thread within the compound to afford greater convenience in handling.

Page 4. Lines 13 to 17.

Page 4 at line 13 to 17 he points out how to increase the resistance by mixing with a compound of lamp black and tar certain matters which when exposed to heat

volatize best he immediately afterwards states his preference for an homogenous carbon filament of considerable length but wound on a spiral so that the extreme radiating surface shall be small.

Page 4. Line 27.

At page 4 line 27 there is an improper division of the paragraph made after the word "bulb" the end of the paragraph is really at line 29 after the word "carbonizing."

Page 4. Line 20 to 29.

Correcting this error it will be found that the paragraph gives directions for uniting either a filament made from plastic material or a filament made from fibrous materials to the platina wires by a plastic material before carbonizing.

There is a further mistake as regards the division of paragraphs. At page 4 line 32 a paragraph ends with the words "bulb" it obviously should have run on to the word "glass" on line 33.

Edison. Page 4. Line 20 to 32

Making this alteration it will be found that the patentee from line 20 of page 4 to line 32 points out that by using the carbon wire of such high resistance he is enabled to have very fine platinum leading wires and that platina can only be used (meaning thereby that only platina can be used) for this purpose as its expansion is nearly the same as that of glass .

Page 4. Line 34 to 39

From line 34 to 39 of the same page the Patentee points out the advantages of coiling so as while employ-

ing considerable length to diminish the radiating surfaces. He says this enables him to raise the heat of the whole and to render the light less sensitive to undulations arising from unsteadiness of current.

Page 4. Line 39 to 42.

Page 4 from line 39 to line 42 the patentee enumerates various materials such as cotton and linen thread wood splints &c. &c. from which his filaments may be made, cautioning the reader however that these are to be of uniform size throughout.

Page 4. Line 42 to 48.

From line 42 to line 48 same page he describes how to prevent the helix of carbon thread from being distorted in the act of carbonization and for this purpose states he uses an intermediate helix of copper that is afterwards to be removed by vitric acid and page 4 from line 48 to line 50 he says that the glass bulb for the filament is to be exhausted by a mercury pump and that the leading tube from it is to be sealed when a high vacuum has been reached.

page 4. Line 48

Page 4. Line 51 to 53.

Page 4 line 51 to 53 the Patentee says that when sybstances are used which are not greatly distorted in carbonizing they may be coated with a non-conducting non-carbonizable substance which would allow one turn of the coil to rest on another and he then refers to the drawing.-

Fig. 1 shows the complete lamp.

Fig. 2 represents the plastic material before being

wound into a spiral.

Fig. 3 shows the spiral after carbonization connected to two leading wires through the glass block and ready to have the bulb blown over it.

And then follow four claims.

First - An Electric lamp for giving light by incandescence consisting of a filament of carbon of high resistance made as described and secured to metallic wires as set forth.

Second- The combination of a carbon filament within a receiver made entirely of glass through which the leading wires pass and from which receiver the air is exhausted for the purposes set forth.

Third - A coiled carbon filament or strip arranged in such a manner that only a portion of the surface of such carbon conductor shall radiate light as set forth.

Fourth- The method herein described of securing the platina contact wires to the carbon filament and carbonizing of the whole in a closed chamber substantially as set forth.

I am informed that the original specification shows no punctuation whatever in the claims except the full stops at the ends.

I think it will be well before investigating these claims to consider what in the body of the specification the patentee has told the reader.

He has told him that the object is to attain the possibility of dividing the electric light up into a number of lamps coupled in multiple arc and to do this without needing main conducting wires of the great size which must be used if these lamps were only of low resistance and also without needing leading wires through the glass of the large size which with low resistance would be required, and he has pointed out that these desirable ends can be obtained by the use of carbon of high resistance instead of the carbon pencils of low resistance previously employed and he says that the carbon of high resistance that he wants is a mere wire or as he frequently calls it a "filament" that a carbonized thread will answer, that you are not to employ pencils or sticks of carbon.

He shows the reader in fact that in every case some kind of filament of carbonizable material is to be taken and is to be formed to the requisite shape in which it is to be used in the lamp and then is to be carbonized. He further tells the reader that the lamp in which the incandescent carbon is to be contained is to be an entire glass structure not a bulb cemented to a metallic base and dependent for its closure upon the cementing adhesion

of a metal stopper but a vessel made entirely of glass left with a loading tube for application of a mercury pump and after exhaustion to the millionth of an atmosphere to be sealed by the art of the glass blower.

He further points out a mode of uniting the fragile carbon filament to the internal platinum wires by the employment of a plastic material to be carbonized with the filament itself.

Having regard to the fourth claim which is for the method herein described for securing the platina contact wires to the carbon filament, and carbonizing the whole in a closed chamber substantially as set forth I am led to believe that the words at the end of the first claim "secured to metallic wires, as set forth", cannot mean that the filament of carbon of high resistance of the first claim must be secured to metallic wires in the particular manner described in the specification as this particular manner forms the subject of the fourth claim I therefore believe that the proper construction of the 1st. claim is to regard it as being for an electric lamp for giving light by incandescence consisting of a filament of carbon of high resistance made as described and secured in the Patentee's mode or any mode to metallic wires.

And, although the Patentee has pointed out the

undesirability of using gas in the bulb of the lamp in lieu of the employment of an exhausted condition. I am of opinion that this first claim would be infringed by any one who employed in an incandescent lamp a carbon filament of high resistance made as described although that lamp might be not an exhausted lamp but one filled with some gas which did not chemically unite with the carbon.

The second claim it will be seen is for the combination of a carbon filament that is to say, such a filament as that of the first claim within a receiver made entirely of glass through which the leading wires pass and from which receiver the air is exhausted for the purposes set forth. This second claim appears to me to speak for itself.

The third claim is also perfectly intelligible It is for so arranging the carbon filament that only a portion of it is radiating heat away the remainder of it having the heat from one portion reflected on to another portion of the same filament thus admitting of a high resistance being obtained by means of a considerable length of the filament without its being open to the drawback of radiating an amount of heat proportioned to the length of the filament as it would do if that filament were employed as a straight wire.

The fourth claim is as I have already stated for the method of securing the platinum contact wires to the car-

bon filament.

Having now dealt with what the Patentee has set forth in his specification and what is, according to my understanding of the language, covered by the claims I will proceed to consider.-

(First). Whether the matters claimed are in excess of that which is foreshadowed by the provisional specification, and I will dismiss this at once by saying that in my opinion they are not in excess.

(Second). I will consider whether there is sufficient instruction given to carry out the invention.

I believe there is quite sufficient instruction given, but it may be that an objection will be raised on one point, and that is as to how the vacuum is to be made in the vacuum lamps. The Patentee states it is to be done by a mercury pump, but he does not state that after the vacuum has been made by the mercury pump a current should be passed through and the making of the vacuum should be continued until no further reduction of the vacuous condition appears from the passing through of the current and that then and not till then should the sealing of the glass bulb be effected.

If this objection is raised it seems to me there are two or three answers to it.

One is that you are told there is to be a "high vacua". It may be retorted that the Patentee says that the bulb is to be sealed after the vacua as he calls

it, is reached, and that that would be true if the vacuum were reached before any current were passed through.

The reply to this may be that the Patentee must have meant, not a high vacuum which was afterwards to be diminished so that there would not be a high vacuum when the lamp was at work, but a condition of things giving a high vacuum after the lamp was at work.

Another answer to the objection appears to me to be this. It cannot be said that even in an exhaustion lamp one without the final exhaustion would not be of any use at all. It might be of very little use but it would be of some use and to the extent to which it was of use the carbon filament of high resistance proposed by the Patentee would be an improvement over the carbon sticks or pencils for the purpose of attaining the object of having incandescent lamps in multiple ard without needing large main conductors and without needing large leading wires through the glass, and that therefore the Patentee had shown an improved lamp. Moreover if I am right in my view that the first claim might be infringed by a lamp wherein there was not any vacuous condition at all but where a gas atmosphere was employed then this appears to me to render the direction about the continuation of the exhaustion after the passage of a current unnecessary.

The third answer which is the best of all depends as to whether it is reasonable having regard to the ex-

tremely limited nature of the subject in the year 1879 and to the notoriety of Mr. Edison as an inventor in this limited subject to expect that a workman in the habit of dealing with electricity as applied to lighting should keep himself informed of published inventions by the same Patentee relating to the same subject more especially when if this workman reads the Provisional Specification of the Patent 4576 he will find as I have noticed in the outset of this report that the reader is referred to the Provisional Specification No. 2402 and he is told that the lamps of the present Patent are of a similar character except that carbon threads or strips are used in place of metallic wires.

This it seems to me should most certainly set the workman to examine even if he would not have done so without such invitation into the final Specification of the patent No. 2402 which would be open to him before the Specification of the Patent 4576 was made public. If he did turn to that specification he would find that the metallic lamps therein described are to have his final exhaustion effected in them and he would also find see p. 10 lines 34 and 35 that this exhaustion was also applicable to the case of carbon and he would thereupon at once proceed to make the final exhaustion.

Edison 1879 No. 2402. Page 10. Lines 34 and 35.

Whether however a Court would hold that a Patentee is entitled to say he has given warning by his Provision-

al Specification that there is a prior Specification relating to the subject I am in some doubt.

Many years ago (1862) I was concerned in the case of Mackelcan & Rennie wherein the Patentee who however appeared in person to conduct his own case and therefore probably to use a homely expression made a mess of it was not allowed to refer to his Provisional Specification which mentioned that the floating docks the subject of the Patent might be made of iron. This statement not having been repeated in the final specification at all and the gist of his action against Rennie was that he Mackelcan being the meritorious inventor of iron floating docks Messrs. Rennie by constructing an iron floating dock were infringers of this patent.

In the first place it was an impudent patent inasmuch as iron ships being known as a change of construction from wooden ships there did not remain patentable invention in the application of iron to the construction of a floating dock when such docks had been previously constructed of wood and in the second place all mention of iron having been omitted from the final specification it seems clear that the patentee should not be allowed to import into that specification from the Provisional Specification that which the Patentee in order to hit this particular defendant alluded to as the very essence of the invention namely the making the dock in iron instead of in wood.

It appears to me that this decision in the case of Mackelcan vs Rennie is not inconsistant with allowing Edison to have the benfit of the information contained in his Provisional Specification that there is a prior patent relating to similar lamps.

It runs in my mind that I have been informed there is a further difficulty of Edison's own creating in this matter and that is that subsequent to his Patent No. 4576 he obtained a Patent for the application of the final exhaustion to a carbon filament lamp.

If this be true it appears to me it should not have any bearing on the case whatever as no subsequent conduct by a Patentee ought to effect a patent he has already obtained, but notwithstanding this is so, one knows as a fact how prejudice is sometimes created against a patent by the subsequent acts of the Patentee.

(Third): I will consider whether the Patent claims matters wanting in utility.

I am of opinion that no objection can be sustained on this ground. The main object of the invention is everyone must agree one of great utility and the four claims according to my interpretation of them are claims which relate to matters within the object of the patent.

I am aware it may be urged that the Patentees do not in fact coil their carbon filament as covered by the

third claim neither as I am informed do they secure the platina contact wires to the carbon filament in the manner of the fourth claim. Nevertheless as I have said it appears to me there is sufficient utility in both of these claims, and with respect to the third I believe it will be found that in lamps of very high resistance indeed this method of coiling will be employed.

(Fourth). I will now consider whether the subjects of these claims or of any of them are wanting in novelty but in doing so I beg leave to say that I have not made any search and that the observations on this head which succeed are confined entirely to the question whether any of the various documents with which you have furnished me anticipate Mr. Edison's inventions.

Taking the Specifications in chronological order

King 1845. I begin with the Specification of Kings Patent of 1845 which I only know through the reprint in the English Mechanic of the 3rd. Jan'y. 1879 with which I have been supplied.

At this early date King very clearly describes an incandescent lamp the material to give forth a light being either platinum or platinum iridium or carbon and King says that when carbon is used the light must be contained in a Torrecellian vacuum.

He says that "that form of carbon on the interior of Coal gas Retorts which have long been used is well

"suited for this purpose and it may be worked into the "form of either small pencils or thin plates by the aid "of the saw and file." This carbon was to be put into clamps top and bottom. The whole was enclosed in the enlarged upper end of a glass barometer tube and the top clamp was in connection with a "short platinum wire "sealed in at the top" i e at the top of the glass tube. From the bottom clamp a copper wire extended to the bottom of the barometer tube the mercury in the tube completing the circuit the copper wire preserving the connection when the mercury fell in consequence of the formation of vapour of mercury. It will be seen that there is here disclosed a carbon incandescent lamp but the carbon was evidently of considerable section made by means of saw and file from a block of carbon already existing instead of being a filament carbonized after it was made to its final dimensions, thus failing to fulfil the conditions of the first claim of Edison namely a carbon filament of high resistance made as described and failing also to satisfy the combination the subject of the second claim in two ways the one that as it did not contain the carbon filament of the first claim (which is also the filament of the second claim) it could not fulfil that combination, and the other that the receiver was not made entirely of glass through which the leading wires pass, for the receiver was closed metallically (i e by the liquid mercury) at its lower end

and into this metallic closure one of the leading wires dipped.

The third and fourth claims of Edison it is obvious are not in any way anticipated by King.

Lane Fox. 1878. 3988.

The Next Specification is that of Lane Fox's Patent of 1878 No. 3988.

There is no doubt this specification shews that Lane Fox thoroughly understood the value of an incandescent lamp of high resistance. He speaks of as much as 100 volts in the conducting wires and he shews that with such resistance the lamps may be coupled in parallel arc (using the earth as the return) and also the arrangement of wires for lighting a district from a central source of supply, and he states that one of his objects is to get high illumination with a very small surface But Mr. Lane Fox suggests no other material to be made incandescent than platinum iridium wire. The vessel which he uses also appears to be a glass vessel with a metallic cap cemented on. Moreover this vessel was not to be exhausted, but sometimes the atmosphere was replaced by nitrogen.

It will no doubt be pointed out that Mr. Edison in his statement in the specification of the prior condition of knowledge speaks in such manner as to lead to the belief that he was the first person who discovered the utility of a lamp of high resistance, and that in thus

speaking he shewed himself ignorant of the disclosure made by Lane Fox in the specification of his Patent of 1878 No. 3988. Nevertheless this should not effect the fact that the Lane Fox disclosure does not anticipate any one of the four claims of Edison's Patent.

Lane Fox. 1878. No. 4043.

The next Specification is that of Lane Fox's Patent of the same year 1878 No. 4043. Herein he refers to his former Specification but does not otherwise give the reader any notion that the lamps are to be of high resistance. He proposes to have the nitrogen filled incandescent lamp of the former patent but to coat the platinum iridium wire of that lamp with various non-conducting refractory materials such as asbestos fire clay, lime magnesia or steatite or even some vitreous material or a mixture of materials or he says page 3 line 21 " I sometimes employ asbestos or other suitable "non-conducting refractory material saturated or impre-"nated with same conducting refractory material such "for example as carbon or iridium."

Page 3. Line 21.

Page 3. Line 25.

Then he says line 25 to 31 that he makes that which he calls a bridge of Asbestos or similar non-conducting material impregnated with some refractory conducting material such as carbon or iridium. The drawings shew the bridge to be short and of considerable diameter.

It will be seen that this is a totally different mode of using carbon from that proposed by Mr. Edison

namely the employment of a carbon filament. It appears to me that there is nothing in this second patent of Mr. Lane Fox to anticipate Mr. Edison.

Lane Fox. 1879. No. 1122.

The next Specification is again that of Lane Fox 1879 No. 1122. This is a "Provisional" only but he speaks here of methods of preparing his luminous bridge as he called it in his prior Specification, and he says that he desires while having the bridge with a resistance of 300 ohms to attain this resistance with a Bridge of small size so as to give little surface. He proposes to employ in this Bridge two materials both highly refractory one to be of conducting material such for example as plumbago mixed or combined in such proportions to give the desired resistance.

He also proposes to deposit on the surface of the Bridge a very hard film or carbon and to do this by passing a current through the Bridge while it is immersed in a dense hydrocarbon. He proposes to unite the ends of the Bridge to a piece of plumbago, or other conducting material and to make the union by placing powdered plumbago in a part of the mould at the time of moulding the Bridge.

Lane Fox. 1879. No. 1122. Page 2. L. 17 to 24

No drawings are given but he says "the parts before "described are hermetically enclosed within a globe or other form of glass or other suitable material

"through one portion of which the conducting wires are "hermetically carried. From this globe all trace "of oxygen carbonic acid gas water and any gas or va- "pour capable of attacking or affecting the material "of the luminous bridge when at a high temperature "must be removed."

It will be seen that Lane Fox retains the luminous bridge of his prior Specification 1878 No. 4626 but he proposes to make it of two materials on of which such as plumbago shall be a conductor and he suggests that a casing of carbon may be deposited, but obviously this luminous bridge and its mode of manufacture are entirely different from the filament of carbon with the mode of manufacture proposed by Edison.

It must be taken I think that Lane Fox has here disclosed that the apparatus may be in a globe made entirely of glass, his former Specifications shewing only glass vessels with metallic covers but there is nothing in this provisional Specification of Fox's to indicate that the globe is to be exhausted. It is true as I have quoted that he says that all trace of oxygen carbonic acid gas, water or any gas or vapour capable of attacking of affecting the material of the luminous bridge when at a high temperature must be removed, but this is perfectly consistant with the suggestion that when removed their place is to be taken by such a

gas as nitrogen the gas that he suggests in his prior Specification, and thus there is no disclosure which would anticipate Edison's second claim of the combination of the luminous carbon with a closed receiver from which the air is exhausted. Moreover of course if the receiver were directed by Lane Fox to be exhausted it would still have failed to anticipate the combination of Edison's second claim because the luminous bridge of Lane Fox is not the same as the carbon filament of Edison's second claim and therefore the combination would not have been made.

It will thus be seen I am of opinion that most undoubtedly Lane Fox's Provisional Specification of 79 has not anticipated either the first or second claims of Edison's Patent. Neither can it be held in any way to anticipate the coiling the subject of the third column, but with respect to the fourth claim there is an apparant approach to similarity in the mode of uniting the ends of the luminous material to the conductor but there appears to be here sufficient difference to keep the two modes distinct as Lane Fox proposes a junction by means of plumbago to blocks of plumbago while Edison proposes the employment of his particular paste and the subsequent carbonization of the whole material I have no doubt whatever that this forms a real and sufficient difference.

Passing from Specifications I now come to statements in Journals, The earlist of these is that in volume 37 at page 307 of the "Engineer" for 1874 It gives a description of Ladygin & Kostoffs incandescent lamps.

The Engineer. 1874. Vol. 37. Page 307.

These were to be composed instead of platinum wires of carbon sticks placed in a closed chamber filled with a gas not containing oxygen. No further time need be bestowed upon the consideration of this publication.

The Engineer. 1875. Vol. 39. Page 43.

The next is contained at page 43 of Volume 39 of the "Engineer" for 1875 which gives an account of Mr. Day of Ohio showing a lamp invented by Prof. Osborne of Maine, U. S. This is an incandescent lamp through carbon placed in an atmosphere of carbonic acid. It is stated that the Professor at first thought it necessary to use very thin strips of carbon but the light is now produced with much larger ribbons and with little combustion There is nothing here to call for further consideration.

The Engineer. Vol. 45. Page 458.

The same remark applies to a statement on page 458 of Volume 45 of the Engineer for 1878 where Reynier's Lamp is described This need not be further considered as it was a lamp wherein the carbon was consumed.

The Engineer. 1878. Vol. 46. Page 374.

At page 374 VoL. 46 of the Engineer also for the year 1878 is a statement of a Mr. Sawyer's lamp who is put forward as a powerful rival to Mr. Edison. Mr. Sawyer it is stated uses a very fine stick almost a thread of carbon it turns out however on perusing the article to the end that he employed a "thread" of a 16th. of an inch in diameter and did so in a closed tube filled with a peculiar gaseous compound the nature of which Mr. Sawyer kept secret. It appears to me that this does not deserve any further attention.

The Engineer. 1879. Vol. 48. Page 32.

The last matter from the Engineer with which I have been furnished is an extract at page 32 Volume 48 of the year 1879 taken from the address of Colonel Bolton to a meeting of the Society of Telegraphic Engineers. He is speaking of Mr. Edison and of Mr. Edison's attempt to coat conductors for purposes of incandescence.

The article goes on to say that this was not new for Prof. Ayrton in a paper published in June 18 (presumably of 1879) says that he in 57 (?) on account of the very fragile nature of every fine carbon used platinum wire coated with carbon And the Editorial comment on it is that Mr. Edison's suggestion of coating the wire with carbon is rubbish or words to that effect.

In conclusion upon this question of novelty I may say that I have read in the Electrician of the 30th.

October 1880 extracts from Mr. Swan's lecture delivered on the 20th. of that month. Mr. Swan there speaks of a lecture of about two years prior date, a date therefore anterior by aboutatwelve month to that of Edison's Patent 4576 but I have no further information than can be gathered from Mr. Swan's statement in 1880 of that which he said in 1878 and I refrain from making any observations therefore as they would have to be entirely conjectional, of how far that which Mr. Swan said or did in 78 may have anticipated Edison's Patent.

In conclusion I beg leave to say in answer to the three questions you put to me.

(1). I am of opinion the Patent 4576 of 1879 should so far as I am able to judge from the materials submitted to me be deemed by a Court of Law to be a valid Patent.

In saying this however I wish once more to call attention to the suggestions I have made as to what an opponent of the Patent might possibly contend (although I as will have been seen from this report am of opinion that this contention should not prevail) against the validity of the Patent in respect of the Patentee not having given directions for the maintenance of the process of exhaustion after the current has been passed through the filament.

(2). I am of opinion that Mr. Edison may expect

to succeed in proceedings to restrain the manufacture by all others of incandescent lamps containing a carbon filament of high resistance in a vacuum or in a gas not acting chemically on carbon.

By high resistance I understand not high resistance of the lamp as a whole for that will depend on its candle power but high resistance per unit of length of the filament.

(3). I am of opinion that for anything which has been laid before me the Patent should not be amended by disclaimer there being so far as appears in that which I have read, no anticipation of any one of the four claims.

Frederick Bramwell.

To

Messrs. Waterhouse & Winterbotham.

No. 1 New Court.

Carey Street.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, June 12th 1882.

Ans'd 15th June

T. A. Edison Esq Menlo Park

Dear Sir

As Messrs Maher & Platt expected to be in a position to order dynamos shortly after I left England, I shall be obliged if you will quote me your lowest prices packed & f.o.b. N.Y. for the dynamos you propose manufacturing as standards, and the information shall be immediately forwarded to my firm.

Yours faithfully
Harry Olrich.

C

60 550 - 5 off -
250 1350

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, June 12th 1882.

Samuel Insull Esq.
Menlo Park NJ.

My dear Sir

I am sorry I missed you on Saturday but I lost a lot of time hunting my mail which had gone astray.

When will you be in town again? Try & get Mr. Hughes to dine with us when you come.

I am relying on you for the information promised re fittings used on several jobs you have completed.

By this mail I have officially asked Edison to quote me for Mather & Platt the prices (packed & f.o.b.) for the different dynamos he intends making in future. I know this will come thro you & would ask you to see that the information is forwarded me as early as

possible.

In future I intend troubling the E. E. L. Co to receive my letters; saving me the journey down town. I have taken a place at the "Lenox" so as to be near the "fighting".

In haste

Yours faithfully
Harry Olnick

47 27
Olnick
June 12. 82

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

Will go through books & decide if analogous to get at same proportionate price.

New York, June 13th 1882.

T. A. Edison Esq
Menlo Park NJ.

Dear Sir

My investigations so far into the manufacture of your dynamo convince me that it will take some time before we shall be ready to make the armatures. Will you therefore be kind enough to quote for your prices for armatures only, for the 3 sizes you are making. This information however is not so much wanted as the prices of dynamos complete

Yours faithfully
Harry Oliver

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C., 15TH JUNE, 1882.

T.A.EDISON ESQ.,
MENLO PARK,
NEW JERSEY. U.S.A.

Miscl. Gen. 1/82

116

DEAR SIR,

ELECTRIC TUBING.

I BEG TO CONFIRM CABLEGRAM AS FOLLOWS, VIZ:-

TO YOU, 10TH JUNE.

"SEND TWO THIRDS STRAIGHT. BALANCE BRANCH BOXES. ORDER FOR STOCK - TWO SIZES ONE, HALF, TWO - FIVE, TWO HALF, THREE QUARTERS - TEN, THREE, FOUR - FIFTEEN, FIVE, SIX - TWENTY SEVEN. TOTAL EIGHT THOUSAND SIX HUNDRED FEET. NECESSARY BOXES ACCORDING JUDGMENT"

FORMAL ORDER FOR THE FOREGOING IS NOW ENCLOSED. IN THE PRICE LIST OF THE ELECTRIC TUBE CO. NOTHING WAS SAID REGARDING DISCOUNT - DOUBTLESS THROUGH INADVERTENCE. THE COMPANY CONSIDER THAT AS THE PRICES CHARGED ARE RATHER HIGH A GOOD DISCOUNT SHOULD BE ALLOWED - AT LEAST FROM 15 TO 20 PER CENT. PLEASE LET THIS MATTER HAVE YOUR ATTEN--TION AT YOUR EARLY CONVENIENCE.

I BEG ALSO TO ACKNOWLEDGE RECEIPT OF YOUR LETTER OF 31ST MAY, AND THE METHOD OF NUMBERING PACKAGES THEREIN DESCRIBED HAS BEEN

DULY NOTED, AND WILL NO DOUBT PROVE OF MUCH SERVICE TO THE STORES DE-
-PARTMENT. THE POINTS RAISED IN YOUR LETTER RE SHIPMENT OF GOODS SHALL
HAVE REPLY IN A DAY OR TWO. SINCE THE ATTACHMENT OF PLATES TO DYNAMOS
WOULD OCCASION YOU CONSIDERABLE INCONVENIENCE THE COMPANY WILL GET THIS
DONE ON THIS SIDE.

I AM, DEAR SIR,

YOURS TRULY,

SECRETARY

ENCLOSURE.

Private and Confidential. June 15. 1882.

E.H. Johnson Esq.

Dear Mr Johnson,

I have prepared a small box containing samples of Insulite which I hand you herewith. The box contains amongst other things a couple of Telegraph Insulators, similar to those supplied to the General Post Office, a round Battery bell which is pressed in a mould, and blocks of Insulite, one of which is made by compressing the warm material and the other by compressing together cold turnings and chips. I also send a ring and a disc, and a bag containing some Insulite dust. I send this last in order that you may explain to Mr Edison that this finely divided powder can be compressed cold under sufficient pressure into a solid homogenous substance. Finely divided wood flour after being treated with resinous Hydrocarbons is disintegrated into a fine dust. For many reasons it will be found convenient to use this method of preparing the article, rather than by turning the thing out of the solid block.
The Insulite excites electrically by friction with a dry silk handkerchief very readily.
If the surface has become deteriorated then it is easily cleaned by a little of the finest glass powder rubbed over it, and then on polishing with a warm silk handkerchief, it will electrify again very easily.
The Telegraph Insulators have been taken out of the solid block, but it will be found most advantageous ultimately to stamp these out by

Hydraulic pressure, or by a blow from a steam hammer, acting on the dust compressed together in a steel mould.

The samples of impregnated wood are intended for use in socket, protection blocks, etc, where ordinary wood warps.

In No 3. C. Dynamo, the Lignum vitae on the brush holders, cracked and warped, and were replaced by Collars and bushes turned out of this impregnated wood, and I have not found after five weeks, any sign of warping, or cracking in them.

The Insulite is not well adapted for cutting into thin plates, but it takes a screw well chased upon it in the lathe, and it also takes and retains ordinary wood screws.

Believe me very sincerely yours

J. A. Fleming

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

3

New York, June 16th 1882.

Olick

T. A. Edison Esq.
Menlo Park N.J.

Dear Sir

I am much obliged by your favor of yesterdays date.

Your remarks re discount shall be carefully noted.

Awaiting your promised quotations for other sized Dynamos and separate armatures.

I remain
Yours faithfully
Harry Olick.

[TO EDWARD H. JOHNSON?]

3

Ans. 8th July

From WATERHOUSE & WINTERBOTHAM, Solicitors.

1, NEW COURT, CAREY STREET, LINCOLNS INN, W.C.

Waterhouse

16th June 1882

Dear Sir

Edison Electric Light

Patent 4576/79

We have had made for you as promised, a Copy of Sir Frederick Bramwell's Report of the 12th June 1882 on the above Patent, in order that you may study it and confer with Mr Edison upon the points raised. You will of course treat it as a confidential communication though there is not much in it which

ford satisfaction

you yesterday it is felt by the advisers of our Company that it will be of the greatest importance in the contest on which we are embarking in reference to this patent that we should have some lamps made exactly in accordance with the specification. To this we understand that you will give immediate and personal attention on your arrival in America.

We are, Dear Sir,

Yours faithfully

Waterhouse & Winterbotham

on hag

Wed

2, Bank Buildings, Princes Street,
London, E.C. June 17. 1882.

Private

My dear Johnson

Just a word to express my satisfaction with the way you spoke of the personal matter. As I told you in view of everything, it has become with me now a consulting more than from the question of money, and certainly your presence here, your kindness & courtesy alone has shaped such action as I would have been fully justified in taking in view of the facts of the case and of the present position of Edison interests here. & none can better appreciate than you can the effect of such a step. I repeat however, that I am not otherwise than amicably & generously met when as now Edison's opportunities are abundant. I will be found very ready to work in such matters interests as you mentioned with, as I believe advantage to you both. Writing however, only for the purpose of thanking you I will not need not enlarge on these things. I am very glad to have renewed your acquaintance & I hope to see much more of you when you are next over. No one has made warmer or more appreciative friends than you have made here, & this at least from apart from your business success, must be a pleasing thought.

Write to me freely whenever you think I can be of any service or when you want anything set in motion preparatory to your coming over, & with my kind regards to you & to your wife believe me

Yours pretty freely
H Wakefield

74 Coleman Street.
London. E.C. } 20th June 1882.

E. H. Johnson Esqre
65 Fifth Avenue
New York
U. S. A.

Dear Sir,

On behalf of the Insulite Company Limited, I have been asked to write and state that the Directors are anxious to place the negociations for the sale of the Patent in the United States exclusively in your hands, and I shall be glad to hear that you will undertake the duty on behalf of the Board. —

My Colleagues are of opinion that a sum of not less than £50,000 should in any event be realized from the American Patents, and they are prepared to give you a Commission of ten per cent upon the amount of the Purchase Money if it does not exceed £50,000, and one per cent in addition for every £5000 the Company may receive beyond the £50,000. —

These terms will, I hope, be satisfactory,

T.

to you, and the Directors have every confidence in your ability and energy, and are quite prepared to consider favorably any modification of the terms of the arrangement you may propose, provided it does not involve a payment in cash of less than £50,000, although of course any agreement would require to be formally sanctioned by the Board, as I doubt if the Articles of Association of the Company would admit of a Contract being absolutely entered into without the previous sanction of the Directors. —

I am Dear Sir

Yours truly

C. Imola Ribble

[TO ARNOLD WHITE?]

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Isle of Man:
June 22nd 1882.

Dear Sir,

We have yours of the 20th inst with estimate for lighting our Works for £600 which shall have our consideration though we think the amount too high.

Yours truly,
(Signed) W. H. Moore & Son.

In reply to yours of 18th inst. We have placed our order for lighting elsewhere.

(Signed) W. H. Moore & Son
Isle of Man.

Sept. 20. 82.

46

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 23 June 1882

Clarke

Mr. S. Insull
Menlo Park, N.J.

Dear Sir

Shall I furnish Mr. H. Olrich with all the Blue Prints he wants, and to whom shall I charge them.

Yours &c
Charles L. Clarke
per Burnham

46

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 23 June 1882

Clarke

Mr. S. Insull
Menlo Park, N.J.

Dear Sir —

Will you please see Mr. Edison about having a draughtsman from the Light Co make drawings of machinery at the Machine Works for Mr. Olrich. Mr. O. met with so much opposition from Mr. Dean that he was disposed to drop it, but if he leaves it to the draughtsman of the Machine Works he will have to wait four months, and then get drawings that will be almost worthless to him. Will you please have this matter settled at once.

Yours &c. Charles L. Clarke
per B.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, June 24th 1882.

T. A. Edison Esq.
Menlo Pk. N.J.

Dear Sir

I am duly in receipt of your favor quoting price of different armatures.
I would however call your attention to the price of C Armature, which I trust you will find has been over estimated. You can see on the face of the quotation that the difference between $4060 and the selling price would not permit of any profit to us. Hoping you will see your way to reducing this price.

I remain
Yours faithfully
Harry Ohnes

2.

46

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 27 June 1882

Clarke

Mr. S. Insull
Menlo Park

Dear Sir —

Will you please send me authorization from Mr. Edison for all drawings, Blue Prints &c. that Mr. H. Olrich may require, also draughtsman services &c in his behalf at the Machine Works.

Yours &c
Charles L. Clarke
per Burnham

Telephone No. 346.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 27TH JUNE, 1883

T. A. EDISON, ESQ.,
MENLO PARK,
NEW JERSEY,
U. S. A.

DEAR SIR,

I BEG TO CONFIRM CABLEGRAMS AS FOLLOWS:-

TO YOU 21ST JUNE.

BAR ARMATURES FOR SIXTY LIGHT MACHINE URGENT.

TO YOU 24TH JUNE.

SHIP TEN "E" DYNAMOS.

PLEASE PUT THE PRICE OF THE E DYNAMOS IN AT AS LOW A FIGURE AS POSSIBLE, AND SEND US YOUR CURRENT PRICES FOR THE FOLLOWING DYNAMOS, VIZ:- B, D, Z, E; ALSO PRICE OF COMMUTATOR BRUSHES ALL SIZES, PRICE OF ARMATURES ALL SIZES AND REVISED PRICE FOR THE C OR 16 CANDLE LAMP.

I HAVE TO ACKNOWLEDGE RECEIPT OF YOUR LETTERS OF 15TH AND 16TH INSTANT WHICH SHALL RECEIVE ATTENTION AND BE DULY REPLIED TO.

I AM, DEAR SIR,

YOURS TRULY,

SECRETARY.

Eggs = 185
Butter 530
Lard 900
K 1850

Cumulatives

C — 4065
K 885
Eggs 185
Lard 37.50

Wkly. Sum. 6/75

46

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 29 June 1882

Mr. T. A. Edison
Menlo Park, N.J.

Dear Sir—

Mr. Dricks wishes to get a 1st. Class man from the Machine Works to take to England with him. In my opinion Jenny now and for some time in the Employ of the Machine Works is the best man he can get. If you sanction it please notify Mr. Dean to that effect, also notify me.

Yours &c
Charles L. Clarke
per B.

Jenny Dricks
but otherwise good man — if O wants him in view of this let me know

Copy!

Mr. Edison's Disclaimers

Opinion

I have carefully read Mr. Edison's letter of the 5th inst and Mr. J. H. Johnson's comments thereon.

Mr. Edison particularly desires that Claim 5 of Patent 578 - 1880 should be retained and considers that its rejection would be a mistake of grave importance - But however practically valuable the device covered by it may be I think there is little doubt that it is not proper subject matter for a British Patent. It was solely on account of the great importance attached to this claim by Mr. Edison in his letter of March 6th last that I hesitated to advise its rejection, although I had previously reported against it. The question was subsequently very fully discussed in consultation with Mr. Webster, with the advantage of Mr. J. H. Johnson's presence and assistance, and it was then decided that the claim must be abandoned. The Arguments contained in Mr. Edison's letter of the 15th inst do not at all affect the grounds upon which our decision was based, and I cannot therefore advise that the patent should be amended as he suggests.

With regard to Patent No 1385 - 1880, it is of course desirable that the Journal which Mr. Edison mentions should be referred to. But there is no reason why the Disclaimer should not be proceeded with.

In the Specification of Patent No. 3080 of 1880 p. 7 l. 14 I do not think that the words "or feeders" are really necessary and there would probably be difficulty or delay in procuring their insertion. In the draft Petition as originally drawn claims 9, 10, 11 and 12 were by my advice allowed to remain. I afterwards suggested to Mr Webster that either the 9th + 11th or the 10th and 12th should be excised, but he was very strongly of opinion that neither the 11th nor the 12th could be retained without grave risk.

The claims which Mr Webster wishes to retain in Patent No 3964 of 1880 were not rejected without the fullest and most careful consideration.

Under the circumstances I do not think it desirable that any of the Petitions should be amended.

sgd. Shelford Bidwell
1 Mitre Court Buildings
Temple
30th June 1882

31 Amd 30.82
Bidwell Opinion

3

From WATERHOUSE & WINTERBOTHAM, Solicitors.

1, NEW COURT, CAREY STREET, LINCOLNS INN, W.C.

Waterhouse

1st July 1882

Dear Sir

Electric Light Patents.
Disclaimers

A Copy of your letter of the 15th ult. addressed to Mr. Arnold White was placed in our hands 4 days ago and we lost no time in securing for it that careful consideration which its importance demanded. A Copy was at once submitted to Mr. J. H. Johnson our Patent Agent & another to Mr. Shelford Bidwell, & they independently arrived at the conclusion that, in spite of the great weight to be attached to your observations, they do not affect the conclusions previously arrived at as to the desirability, having regard to the requirements of English Law, of allowing the Petitions for the Disclaimers to stand as presented. We feel sure that you will give credit to all here concerned for desiring in this matter to protect the interests which you have in common with the Edison Coy to the very best of our ability, & that you will believe that the decision arrived at has not been come to without a due sense of the importance of those interests.

We think you may like to see the enclosed Copy of Mr. Bidwell's Observations on the points raised in your letter.

We are Dear Sir
Yours faithfully
Waterhouse & Winterbotham

T. A. Edison Esq.
Menlo Park
New Jersey
U.S.A.

I beg to acknowledge your favours of 1st & 8th inst with copy of Mr Bidwells opinion for which accept my thanks

Telephone No. 946.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 1ST JULY, 1882

T. A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY.

DEAR SIR,

I BEG TO ACKNOWLEDGE CABLEGRAM AS FOLLOWS:-

FROM YOU 27TH JUNE.

"MAN NAMED BIEDERMANN WITH DISCHARGED EMPLOYEE NAMED MOTT SAILED FOR GENEVA VIA LONDON. HAVE NO CONNECTION WITH EITHER."

FOR WHICH I AM TO THANK YOU. SHOULD EITHER OF THE PERSONS NAMED MAKE APPLICATION FOR EMPLOYMENT WITH THE COMPANY, THEY SHALL BE DEALT WITH AS YOU DESIRE.

PROSPECTUSES.

I BEG TO ACKNOWLEDGE RECEIPT OF YOUR LETTER OF 20TH JUNE. NOT HAVING ANY OF THE MANCHESTER COMPANY'S PROSPECTUS ON HAND THESE HAVE BEEN WRIT--TEN FOR AND WILL BE SENT YOU IN A DAY OR TWO. YOU SHALL DULY RECEIVE COPIES OF THE PROSPECTUS OF ANY COMPANY WHICH MAY BE FORMED IN CONNEC--TION WITH THIS COMPANY.

SOCKETS.

I BEG TO CONFIRM CABLEGRAM AS FOLLOWS:-

TO YOU 1ST JULY.

"RUSH SOCKETS."

PLEASE LET THIS HAVE YOUR BEST ATTENTION, AS THE STOCK OF SOCKETS IN HAND IS GETTING EXCESSIVELY LOW.

PLEASE PUT IN HAND AT ONCE THE FOLLOWING ORDER, VIZ:-

10 COMPLETE SETS OF COMMUTATORS FOR SMALL ARMATURES.

2 GROSS SCREWS THEREFOR.

1 DOZEN TAPS OF PROPER SIZE.

A QUANTITY OF ARMATURE WIRE SUFFICIENT FOR REPAIRING TEN ARMA--TURES.

CANVAS COVERS FOR SAME.

A QUANTITY OF BRASS WIRE FOR BANDS.

3 ARMATURE HEADS OF VULCANIZED FIBRE.

10. 110 VOLT ARMATURES "Z" DYNAMOS.

ALL FOR "Z" DYNAMOS.

I AM, DEAR SIR,

YOURS TRULY,

Amos Wilcox

Aug. 1st 82

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Telephone No. 846.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 4TH JULY, 1882

T.A.EDISON ESQ.,
MENLO PARK,
NEW JERSEY.

DEAR SIR,

I BEG TO CONFIRM CABLEGRAM AS FOLLOWS, VIZ:-

TO YOU 4TH JULY.

MAIL PAPER TEMPLATE BED-PLATE NEXT C DYNAMO TO GIVE EXACT SIZE FOR FOUNDATION NOW PREPARING AND POSITION OF BOLTS.

IF THE COMPANY HAVE THE EXACT DIMENSIONS OF THE BED-PLATE OF THE C DYNAMO, THE WORK OF PREPARING THE FOUNDATIONS CAN BE GOING ON, SO AS TO HAVE EVERYTHING READY FUR PUTTING DOWN THE DYNAMO ON ITS ARRIVAL.

THE ENCLOSED EXTRACT FROM THE REPORT OF THE STREETS COMMITTEE OF THE COMMISSIONERS OF SEWERS MAY BE OF INTEREST TO YOU.

I AM, DEAR SIR,

YOURS TRULY,

Arnold White

SECRETARY

ENCLOSURE

3

from WATERHOUSE & WINTERBOTHAM.
Solicitors.

1, NEW COURT,
Waterhouse
CAREY STREET,

LINCOLNS INN, W.C.

9th July 1882

Dear Sir

Electric Light Patents
Disclaimers.

You will have received our letter of the 1st inst following our telegram of the 29th ult: We write a line now to inform you that the Law Officer has granted the Disclaimers on the terms asked and in accordance with his Fiat the Disclaimers will be duly filed in the course of a day or two.-

We are Dear Sir
Yours faithfully
Waterhouse & Winterbotham

T. A. Edison Esq:
Menlo Park New Jersey U.S.A.

The Edison Electric Light Company, Limited,

Telephone No. 346.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

74, Coleman Street,

London, E.C., ...188.....

T.A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY. U.S.A.

WITH MR. ARNOLD WHITE'S COMPLIMENTS.

[ATTACHMENT]

[TO ARNOLD WHITE?]

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

EXTRACT OF LETTER FROM MESSRS THOMSON STERNE & CO. LD. CROWN IRON WORKS, GLASGOW, 8TH JULY, 1882.

"WE ARE VERY PLEASED TO STATE THAT WE HAD A MOST "SATISFACTORY TRIAL LAST NIGHT, OUR 6 H.P. ENGINE "GIVING A BRILLIANT AND STEADY LIGHT WITH 70 OF "YOUR B LAMPS. WE SHALL BE GLAD IF YOU WILL "COMMUNICATE THIS INTELLIGENCE TO MR. JOHNSON AND "DR. FLEMING."

[ATTACHMENT]

C O P Y.

LINCOLN. 11 JULY 1882.

ARNOLD WHITE ESQ.,
SEC.
THE EDISON ELECTRIC LIGHT COMPANY LIMITED,
74, COLEMAN STREET,
LONDON. E.C.

DEAR SIR,

IN REPLY TO YOUR ESTEEMED FAVOR OF THE 10TH INSTANT, WE HAVE THE PLEASURE OF STATING THAT THE EXPERIMENTAL TRIAL WE MADE OF THE EDISON SYSTEM OF ELECTRIC LIGHT IN OUR WORKSHOPS HAS SUCCEEDED ADMIRABLY. WE USED IN ALL 120 LIGHTS GIVING ONE TO EACH MAN. THE EXPERIMENT WAS SIMPLY AND EASILY TRIED BY UNSCREWING THE GAS BURNERS AND AFFIXING THE ELECTRIC LAMPS TO THE OLD GAS FITTINGS, CARRYING THE WIRES ALONGSIDE THE PIPING. THOUGH WE USED ONLY HALF LAMPS, NAMELY 8-CANDLE POWER, YET WE FOUND THE LIGHT GIVEN FROM THEM TO BE QUITE EQUAL TO A LARGE GAS BURNER, AND TO BE MUCH SUPERIOR IN ITS ADAPTABILITY FOR WORKSHOP PURPOSES, INAS--MUCH AS THE LIGHT CAN BE TURNED UPSIDE-DOWN AND PLACED WITHIN CYLINDERS AND OTHER PARTS OF ENGINES WITHOUT LOSING ANYTHING IN BRIGHTNESS AS IS THE CASE WITH A GAS JET WHEN THUS USED. OUR MEN FOUND IT VERY COMFORT--ABLE TO WORK WITH, THE ATMOSPHERE OF THE SHOP NOT ONLY BEING LESS HEATED BUT ALSO MUCH PURER THAN IS POSSIBLE WHEN GAS LIGHTS ARE USED. WE WERE SO SATISFIED WITH THE RESULT OF THE EXPERIMENT THAT IN SOME VERY LARGE NEW WORKS WE ARE NOW BUILDING, WE ARE PUTTING IN EDISON LAMPS ONLY, A FEW ARC LIGHTS FOR THE LARGE SPACE, AND INCANDESCENT LAMPS FOR THE BENCH AND TOLL WORK - AND ENTIRELY DISPENSING WITH GAS. ONE VERY GREAT ADVANTAGE WE FIND IN THE USE OF THE INCANDESCENT EDISON LAMP IS ITS ABSOLUTE SAFETY AND THE GREAT CONVENIENCE AND SAVING OF TIME IT IS TO THE WORKMEN, WHO ARE ABLE TO TURN THEIR LIGHTS IN AND OUT AS MAY BE REQUIRED WITHOUT THE

[ATTACHMENT]

TROUBLE AND DANGER INCIDENTAL TO THE USE OF A MATCH OR OTHER NAKED LIGHT TO LIGHT THEM.

WE ARE,

YOURS FAITHFULLY,

SIGNED ROBEY & CO.,

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[TO ARNOLD WHITE]

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

66, Old Broad Street,
London. 17th July, 1882.

Dear Sir,

I have received your letter of the 22nd June, and your further letter of the 13th July.

The amounts you ask for Electric Lighting is so much in excess of the price of Gas or the present means of lighting which I have, that I cannot for a moment entertain it.

Yours truly,
(Signed) W. Payton
for John Pender.

The Secretary,
Edison Electric Light Coy.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 19 July 1882

Mr. T. A. Edison
Menlo Park, N. J.

Dear Sir —

Will you please send this Company an order for Blue Prints of all Dynamo drawings and Electric Light appliances to be sent to London so soon as finished & charged to London Co.

Yours &c.
Charles L. Clarke
per Burnham

Copy

MACINTOSH LANE,
HOMERTON.
LONDON JUDY 19. 1882

THE EDISON ELECTRIC LIGHT CO. LIMITED.

GENTLEMEN,

IN REPLY TO YOUR REQUEST, WE TAKE GREAT PLEASURE IN STATING OUR EXPERIENCE OF THE EDISON INCANDESCENT ELECTRIC LAMPS.

WE BELIEVE OURS TO BE THE FIRST FACTORY IN LONDON THAT WAS LIGHTED WITH YOUR SYSTEM, AND ARE AT PRESENT USING 120 OF YOUR EIGHT CANDLE POWER LAMP WITH A FEW 16 CANDLE POWER LAMPS. THESE HAVE NOW BEEN RUNNING A MATTER OF 1490 HOURS DURING WHICH TIME ONLY FIVE LAMPS HAVE GIVEN OUT AND THESE NOT UNTIL THEY HAD BEEN BURNING A PERIOD OF OVER 900 HOURS. WE FIND THE EIGHT FROM SAME A GREAT BOON TO US IN OUR PARTICULAR BRANCH OF BUSINESS WHICH IS ELECTRIC WIRE COVERING, AND WHICH AT THE PRESENT TIME WE ARE EXCEEDINGLY BUSY IN NECESSITATING US TO WORK BOTH DAY AND NIGHT, CONSEQUENTLY WE HAVE GIVEN YOUR LAMP A VERY SEVERE TEST.

THE STEADINESS, BRILLIANCY ETC. OF THE LIGHT ALL CONTINUE TO MAKE IT A MOST DESIRABLE LIGHT FOR ALL MANUFACTURERS.

YOURS TRULY

PHILLIPS BROS.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 20TH JULY, 1882

MY DEAR EDISON,

I HAVE RECEIVED YOUR LETTER OF JULY THE 5TH ON THE SUBJECT OF THE COST OF MACHINERY AND I NOTE THE POINTS ON WHICH YOU REQUIRE SPECIFIC INFORMATION. I AM TAKING IMMEDIATE STEPS TO SUPPLY YOUR WANTS IN THIS RESPECT AND SHALL HOPE TO COMMUNICATE TO YOU IN THE COURSE OF THREE OR FOUR DAYS PRICE LISTS OF SIEMENS, SWAN & BRUSH TOGETHER WITH PARTICULARS OF CANDLE POWER, HORSE POWER & COST.

YOU WILL BE GLAD TO HEAR THAT CONTRARY TO EXPECTATION THE THE GOVERNMENT HAVE TAKEN UP THE BILL AND ON SATURDAY IT WAS PASSED THROUGH COMMITTEE AT A SITTING. THIS MEANS THAT THE BILL IS SAFE TO PASS THE HOUSE OF COMMONS, AND THE ONLY QUESTION IS AS TO WHETHER THE HOUSE OF LORDS WILL THROW IT OUT. BEING A GOVERNMENT MEASURE, I DO NOT THINK THERE IS ANY DOUBT BUT THAT THAT BILL WILL BECOME LAW THIS YEAR. IT IS QUITE ABSURD TO WATCH THE IGNORANCE OF PARTIES NOMINALLY INTERESTED IN ELECTRIC LIGHTING AND THEIR BLINDNESS TO THEIR OWN INTERESTS AS CONTAINED IN THIS BILL. THE EDISON COMPANY WAS THE ONLY ONE WHO PROTESTED AGAINST THE TERM OF YEARS BEING RESTRICTED TO 15 AND WE WERE ACCORDINGLY MET IN THE HOUSE OF COMMONS BY THE UNANSWERABLE REPLY FROM THE PRESIDENT OF THE BOARD OF TRADE THAT ALTHOUGH THE EDISON COMPANY MIGHT BE DISSATISFIED ALL THE OTHER COMPANIES WERE CONTENT.

IN ORDER TO OVERCOME THE BAD EFFECT PRODUCED BY THE HASTY ADMISSIONS OF THE BRUSH AND MAXIM COMPANIES (OF WHICH LATTER I CAN HARDLY SPEAK WITH--OUT CONTEMPT AND DISGUST) I HAVE PREPARED A PETITION, COPY OF WHICH IS ENCLOSED, WHICH IS BEING CIRCULATED AMONG THE PRINCIPAL COMPANIES AND WHICH WILL BE PRESENTED TO THE HOUSE ON THE THIRD READING. SIR JOHN LUBBOCK WILL REFER TO THIS PETITION IN HIS SPEECH AS EVIDENCE OF THE INACCURACY OF THE IMPRESSION OF THE GOVERNMENT THAT ALL THE ELECTRIC LIGHT COMPANIES EXCEPT THE EDISON COMPANY ARE CONTENT WITH THE PERIOD OF 15 YEARS.

I AM HAPPY TO TELL YOU THAT OUR PROSPECTS IMPROVE. WE HAVE GOT AN ORDER TODAY TO LIGHT THE WATERLOO TERMINUS OF THE LONDON & SOUTH WESTERN RAILWAY, BUT AS THE OFFICIAL ORDER HAS NOT COME IN PLEASE DO NOT LET MAJOR EATON PUBLISH THIS FACT UNTIL I SEND IT TO HIM DIRECT. I SHALL ENDEAVOUR TO SEND YOU BY THIS MAIL COPY OF HOPKINSON'S & FLEM--ING'S REPORT ON THE HOLBORN VIADUCT INSTALLATION, WHICH IS A VERY ABLE DOCUMENT, AND THE RESULTS OF WHICH ARE ON THE WHOLE SATISFACTORY.

THE FINANCIAL TROUBLES THROUGH WHICH THIS COUNTRY IS NOW PASSING HAVE HAD A GREAT EFFECT ON ELECTRIC LIGHTING. THE SHARES OF THE SUBSIDIARY COMPANIES OF THE BRUSH ARE NOT ONLY AT A DISCOUNT BUT ARE WHOLLY UNSALEABLE. MR. BOUVERIE AND SIR JOHN LUBBOCK ARE GLAD THAT WE HAVE NOT FOUND OURSELVES WITH A CROWD OF SUBSIDIARY SHARE-HOLDERS

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C., 188

CLAMOROUS AND DISCONTENTED, BUT THAT WE HAVE TAKEN THE MORE DIGNIFIED AND QUIET COURSE OF SOLIDIFYING OUR POSITION BEFORE ACTUALLY LAUNCHING SUB-COMPANIES. WE SHALL HAVE THREE MORE COMPANIES OUT BY OCTOBER.

JOHNSON IS MISSED TERRIBLY HERE. HE HAD A CAPACITY FOR INSPIRING FAITH WHICH EXCEEDED THAT OF ANY OTHER MAN WITH WHOM I EVER CAME IN CONTACT. ALTHOUGH MY FAITH IS EQUAL TO HIS I CANNOT PRETEND TO MORE THAN A TENTH OF HIS POWER OF IMPARTING IT TO OTHERS. WE ARE HOWEVER, MORE THAN HOLDING OUR OWN AND WE HAVE MOST POWERFUL INFLUENCES WITH US.

LEARNING FROM SOME OF THE MISTAKES WE MADE IN THE OLD TELEPHONE DAYS, WE HAVE AGREED TO JOIN AN ELECTRIC LIGHT BUND COMPOSED OF REPRESENTATIVES OF THE PRINCIPAL COMPANIES. THE CARDINAL PRINCIPLE OF THIS SOCIETY IS THAT WE SHALL FIGHT AMONG OURSELVES AS MUCH AS WE LIKE BUT AGREE TOGETHER TO DEFEND OURSELVES AGAINST OUTSIDERS AND THAT WE UNITE AGAINST THE GAS COMPANIES AND AGAINST SMALL INFRINGERS. ONE OF THE EFFECTS OF THIS ARRANGEMENT IS THAT THE FIVE DISCLAIMERS TO THE PATENTS HAVE BEEN ALREADY PASSED BY THE ATTORNEY GENERAL WITHOUT OPPOSI--TION FROM SWAN OR LANE FOX. YOU WILL REMEMBER, HOW MANY MONTHS WERE CONSUMED BEFORE THE DISCLAIMERS WERE ALLOWED ON THE TELEPHONE PATENTS.

4.

WE ARE ABOUT TO PUT IN LARGE INSTALLATIONS AT WESTMINS-
-TER, AT HOLBORN AND OTHER PLACES, FULL DETAILS OF WHICH I WILL SEND
YOU AND JOHNSON FROM TIME TO TIME.

YOURS VERY TRULY,

Emile Wheeler

THOMAS ALVA EDISON ESQ.,
MENLO PARK,
NEW JERSEY. U. S. A.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., JULY 20 188

MY DEAR MR. INSULL,

I WANT YOU TO BE GOOD ENOUGH IF YOU WILL TO FIND OUT THE CHARACTER AND STANDING OF A MR. GEORGE SHEPARD PAGE OF 49 WALL STREET, NEW YORK. HE HAS BEEN OVER HERE AND HAS MADE FRIENDS WITH THE DUKE OF SUTHERLAND AND OTHERS. SIR HENRY GREEN HAS ASKED ME TO FIND OUT ALL ABOUT HIM AND AS HE IS TRYING TO GET ROUND OUR INSULITE PATENTS also. I AM VERY ANXIOUS ON MY OWN ACCOUNT TO DO SO.

YOURS VERY TRULY

Imola Wilke

SAMUEL INSULL ESQ.

MENLO PARK

NEW JERSEY

U.S.A.

Answ July 22

BERGMANN & CO.,
108-114 WOOSTER STREET.
(BY APPOINTMENT)
MANUFACTURERS OF EDISON'S INVENTIONS,
EDISON'S ELECTRIC LIGHT APPLIANCES A SPECIALTY.

New York, July 21 1882

Edison.

Will you put upton to work on this They must be made absolutely in accordance with the letter of the Patent Even to the most minute and insignificant detail

Yours E.H.J.

The Edison Electric Light Company

65 Fifth Avenue

Norvin Green Pres
S. B. Eaton Vice-Pres
W. P. Fabbri Treas
J. C. Goddard Sec'y

New York, July 21st. 188

Samuel Insull, Esq.

Menlo Park.

N. J.

Dear Sir:-

Many thanks for your favor of the 19th. inst. containing two copies of the prospectus of the Manchester Company.

Very truly yours,

S: B. Eaton.

Per Mc.G.

3 July 82
Manchester Co

The Manchester and District
Edison Electric Light Company Limited.
(Temporary Offices)
5, Norfolk Street
Manchester. July 1882

Sir,

The Edison Electric Light.

We desire to inform you that the Manchester & District Edison Electric Light Co. Ld is now prepared to enter into contracts for the lighting of Mills, Manufactories, Workshops, Houses, & other Buildings by the Edison Electric Light.

We shall be glad to enter into negotiations with you, should you desire to use the light either on the basis of your purchasing outright from us the complete plant necessary to your requirements, or on hiring the same from us at a yearly rental with option of purchase.

We are prepared to supply all the machinery necessary including the most economical motive power suited to your convenience for driving the Edison Dynamo Machine, should you not already possess available power.

We shall be glad to send one ~~of your staff to make all measurements of~~ your premises with a view to preparing an estimate, without binding you in any way, but simply for your information and guidance.

We beg to enclose a description of the chief merits of the Edison system, as compared with all others hitherto developed.—

For further particulars please ~~apply to the Secretary at the above address~~

Hoping this notice may receive your early consideration—

We are

Yours truly

Ernest Crewdson
Secretary pro tem

V. K. Armitage
Chairman

Enclosure

3

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 8th August, 1882.

T. A. Edison, Esq.
Menlo Park,
New Jersey, U.S.A.

Dear Sir,

I enclose you Copies of Crompton's Price Lists, with letter from them to Dr. Hopkinson.

I am, Dear Sir,
Yours truly,
Arnold White
Secretary
pro E.E.L.C.

Acknowledge receipt with thanks

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 11TH AUGUST, 188 2.

T. A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY,
U. S. A.

DEAR SIR,

SOCKETS.

ENCLOSED I BEG TO HAND YOU COPY OF LETTER SENT TO-DAY TO MESSRS BERGMANN & CO. BE GOOD ENOUGH TO PRESS THEM FOR AN EXPLANATION, AS WE ARE SERIOUSLY PREJUDICED BY THEIR ERRORS IN THE DELIVERY OF THE SOCKETS.

I AM, DEAR SIR,

YOURS TRULY,

Arnold White
SECRETARY

ENCLOSURE.

[ENCLOSURE]

(No. 26)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

11TH AUGUST, 1882

MESSRS BERGMANN & CO.,
108, WOOSTER STREET,
NEW YORK.

DEAR SIRS,

SOCKETS.

WE REGRET TO HAVE TO DRAW YOUR ATTENTION TO THE SERIOUS MISTAKES WHICH HAVE OCCURRED IN THE DELIVERY OF GOODS, ORDERED ON MAY 31ST AND SHALL BE GLAD TO RE-CEIVE AT YOUR EARLIEST CONVENIENCE A FULL EXPLANATION THEREOF.

SOCKETS - OUR ORDER WAS FOR:-

500 JAPANNED WITHOUT COCKS

150 BRASS WITHOUT COCKS

250 POL. BRASS WITHOUT COCKS

100 GOLD BRONZE WITHOUT COCKS

125 JAPANNED IRON WITH COCKS

125 BRONZE

POL. BRASS - NIL

50 GOLD BRONZE

30 ASSORTED SAMPLES

TOTAL 1330

WHEREAS YOU HAVE ALREADY SENT US

225 JAPANNED IRON WITH COCKS

750 POLISHED BRASS

100 GOLD BRONZE WITHOUT COCKS

NO JAPANNED WITH COCKS

NO BRASS WITH COCKS

2691 POLISHED BRASS WITH COCKS

578 GOLD BRONZE WITH COCKS

[ENCLOSURE]

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

20 ASSORTED SAMPLES

TOTAL 4354

OR RATHER OVER 3000 MORE THAN OUR ORDER, BESIDES THIS, IN ACCORDANCE WITH THE CABLEGRAM SENT BY MR. JOHNSON FROM THE COMPANY, ON MAY 16TH WE AGREED TO TAKE ONE THIRD OF THE ORDER IN "OLD PATTERN" OR SAY 440 IN OLD PATTERN.

WE SHALL OF COURSE EXPECT A CREDIT NOTE FOR THE FURTHER 25 O/O, OFF THE BALANCE OF THESE SOCKETS IF WE KEEP THEM, AS THE NEW FORM "ACORN" SOCKET CAN BE PRODUCED HERE AT 1/2 1/2 AGAINST YOUR PRICE OF 3/4 DE--LIVERED FOR NO. 150, POLISHED BRASS SOCKETS WITH COCKS, OF WHICH YOU HAVE UP TO DATE SENT US 2691 WITHOUT ANY ORDER WHATEVER, AND OF COURSE AS THE DIFFERENCE IS SO HEAVY, WE ARE PLACED AT A GREAT DISADVANTAGE WITH OUR RIVALS, ONE OF WHOM, SUPPLIES HIS SOCKETS AT 1/- EACH.

WIRE SHADE HOLDERS. IN OUR ORDER OF THE 31ST MAY, NO MENTION WAS MADE OF THIS ARTICLE AS WE WERE WELL AWARE THAT IT COULD BE IMPROVED UPON, AND PRODUCED HERE AT A PRICE CONSIDERABLY LOWER THAN THAT CHARGED BY YOU. WE TRUST THAT THE BALANCE OF OUR ORDER WILL COME FORWARD CORRECTLY, AS WE DO NOT WISH TO BE SADDLED WITH MATERIALS WHICH CAN IN MANY INSTANCES BE PRODUCED HERE AT A MUCH LOWER RATE.

I AM, DEAR SIR,

YOURS TRULY,

(ep) Arnold White

SECRETARY.

Sent

[ENCLOSURE]

SCHEDULE OF PLANT AND MACHINERY.

7.6.39	100, HUNDRED LIGHT DYNAMOS.
15 7.6.39 10 " " 29	25, TWO HUNDRED AND FIFTY LIGHT DYNAMOS.
" " 39	30,000 LAMPS ~~CYLINDRICAL.~~
	32 REGULATORS.
	32 INDICATORS.
	ASSORTMENT FIXTURES. SOCKETS. BLOCKS. SWITCHES ETC.
7.6.39	25 SPARE BAR ARMATURES.
" 26	6,-1000 LIGHT DYNAMOS.

~~Foreign Order 29~~

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The Edison Electric Light Company, Limited,

Telephone No. 346.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

74, Coleman Street,

London, E.C., 17TH AUGUST. 1882.

T. A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY. U. S. A.

DEAR SIR,

Z DYNAMOS.

I BEG TO CONFIRM CABLEGRAM AS FOLLOWS:-

TO YOU 17TH AUGUST.

"COMPLETE WORKING DRAWINGS Z DYNAMO WANTED URGENTLY."

THE DRAWINGS HAVE BEEN ALREADY CABLED FOR ON 19 JULY, AND IT IS VERY IMPORTANT THAT THEY SHOULD BE HERE AT THE EARLIEST POSSIBLE MOMENT.

I AM, DEAR SIR,
YOURS TRULY,

SECRETARY.

C O P Y.

74, COLEMAN STREET,

LONDON, E.C. 18TH. AUGUST, 1882

FRANCIS R. UPTON ESQ.,
THE EDISON LAMP COMPANY,
EAST NEWARK,
NEW JERSEY, U.S.A.

DEAR SIR,

10 CANDLE-LAMP.

I BEG TO ACKNOWLEDGE THE RECEIPT OF YOUR LETTER OF THE 28TH ULTIMO. THE COMPANY HAVE GIVEN THE ORDER FOR 10 CANDLE LAMPS SOLELY BECAUSE THEY UNDERSTOOD THAT A GREATER AMOUNT OF LIGHT IS PROCURABLE FROM THEM THAN FROM 8 LAMPS AT AN EQUAL EXPENDITURE OF POWER, OR IN OTHER WORDS THAT THEY ARE A MORE ECONOMICAL FORM OF LAMP. AN EXCESSIVELY HIGH PRICE FOR THE LAMPS WOULD HOWEVER DEFEAT THEIR RAISON D'ETRE, AS THE COST OF THE LAMP TO THE CONSUMER WOULD FOR A CONSIDERABLE PERIOD MORE THAN COUNTERBALANCE ITS ECONOMY. IN REGARD TO THE PRICE YOU NAME FOR THE ORDER ON HAND - 75 CENTS - I WOULD BEG TO CALL YOUR ATTENTION TO CLAUSE 10 OF THE AGREEMENT BETWEEN MR. EDISON AND THE COMPANY, WHICH SAYS:- "THE SAID THOMAS ALVA EDISON WILL FROM TIME TO TIME WITH ALL REASONABLE DESPATCH SUPPLY TO THE COMPANY AT THE PRICES CHARGED BY HIM TO HIS MOST FAVOURED CUSTOMER (SUCH PRICES NOT TO EXCEED 50 CENTS EACH FOR ISOLATED BUSINESS & 40 CENTS EACH WHERE THE LAMPS ARE TO BE USED IN CONNECTION WITH CENTRAL LIGHTING STATIONS) ALL SUCH ELECTRIC LAMPS AS SHALL BE REQUIRED BY THE COMPANY FOR THE PURPOSE OF THEIR OPERATIONS."

I AM, DEAR SIR,
YOURS TRULY,
SIGNED ARNOLD WHITE.
SECRETARY.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, 23 Aug 1882

Mr. T. A. Edison
Menlo Park N.J.

Dear Sir –

Mr. Olrich wished me to send him Blue prints of all the dynamos as soon as completed, but left without having me an order for them, or where to send them.

The Blue prints of I dynamo are now ready for him. What shall I do with them?

Yours &c
Charles L. Clarke
per Burnham

give Clarke Olrich address

Rec'd.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY,

Answered 17th September

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 24TH. AUGUST, 1882

T.A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY,
U.S.A

DEAR SIR,

I HAVE YOUR LETTER OF THE 11TH. AUGUST ON THE SUBJECT OF MACHINERY, ALSO A LONG COMMUNICATION FROM MR. JOHNSON ON THE SAME SUB--JECT. IT WILL PERHAPS BE BETTER IF I TAKE YOUR LETTER PARAGRAPH BY PARAGRAPH.

THE FIRST MACHINES YOU SENT US UPON WHICH THE ESTIMATE WAS BASED WERE CHARGED WITH PACKING & DELIVERY ON BOARD. TO THIS HAD TO BE ADDED FREIGHT, LANDING, DELIVERY, CARTAGE, PAINTING, INTEREST & DEPRECIATION, RENT AND OTHER INCIDENTALS. ASSUMING, HOWEVER, NOW THAT THE CHARGE OF $550 IS F.O.B., THE COST OF THE 2 MACHINES IN LONDON IS NOT LESS THAN £125. THE ELECTROLIERS WERE TAKEN FROM BERGMANN'S PRICES, BUT WE HAVE TAKEN THE ADVICE YOU WERE GOOD ENOUGH TO OFFER AND HAVE RE--CEIVED VARIOUS TENDERS FROM FIRST CLASS ENGLISH MAKERS FOR ELECTROLIERS AND OTHER FITTINGS. FOR YOUR INFORMATION I SEND YOU A COMPARATIVE LIST OF PRICES.

YOUR CRITICISM ON THE SWITCH IS NO DOUBT A JUST ONE, AL--THOUGH I THINK YOU ARE IN ERROR IN SAYING THAT SWAN DOES NOT PUT IN ANY SWITCHES AS BY HIS ESTIMATE BEFORE ME I SEE HE CHARGES 15/- FOR A TWO WAY SWITCH WHILE WE CHARGE £1.2.0. THIS IS ONLY A DIFFERENCE OF

7/6 AND DOES NOT MATERIALLY AFFECT THE FACTS EITHER WAY. WITH SINCERE DEFERENCE TO THE OPINION YOU EXPRESS I DO NOT THINK THAT WE CAN AFFORD TO DISPENSE WITH ELECTROLIERS & SWITCHES. TO DO SO WOULD ONLY INVOLVE CORRESPONDENCE AND THE DISCOVERY OF THE FACT ON THE PART OF WOULD BE CUSTOMERS THAT WE HAD IMPLIED THE COST OF AN INSTALLATION TO BE LOWER THAN IT REALLY WAS.

I NOTE THAT JOHNSON THINKS HE CAN MAKE US A CHEAPER SOCKET WITHOUT COCKS FOR 20 CENTS, BUT SEEING THAT WE HAVE RECEIVED SEVERAL THOUSAND SOCKETS COSTING $1.0.. CENTS IT IS OBVIOUS THAT WE MUST GET RID OF THESE BEFORE WE CAN USE AN ARTICLE ONE FIFTH OF THE COST. IN THE MEANTIME I MAY SAY THAT WE HAVE JUST GIVEN OUT A TENDER FOR 5000 SOCKETS WITHOUT COCKS AT 1/2, SAY 25 CENTS, LESS 2/2 PER CENT DELIVERED IN LONDON.

I HAVE READ & EXAMINED WITH GREAT INTEREST YOUR SO LIGHT INSTALLATION WHICH YOU COMPARE WITH SWAN'S AND YOU WILL I KNOW PARDON ME FOR POINTING OUT THAT THE COMPARISON IS MADE ON NET COST TO THE COM--PANY, NOT EVEN IN LONDON, BUT IN NEW YORK, IN THE CASE OF THE EDISON COM--PANY, WITH THE GROSS PRICE INCLUDING PROFIT CHARGED BY THE SWAN COMPANY. IT SEEMS INDISPUTABLE THAT NO COMPARISON IS A JUST ONE UNLESS YOU COM--PARE LIKE WITH LIKE, AND AS WE DO NOT KNOW THE ACTUAL COST TO SWAN OF HIS LAMPS & MACHINERY IT IS ONLY FAIR TO COMPARE THE GROSS PRICES IN THE CASE OF EACH COMPANY. JOHNSON HITS ME RATHER HARD IN HIS LETTER OF THE 9TH. OF AUGUST, WHICH I NOTE THAT YOU HAVE READ, BUT I THINK NOT

3

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., ... 188..

WHOLLY WITH JUSTICE. NO OPPORTUNITY IS LOST by us OF DENOUNCING IN SEASON AND OUT OF SEASON THE UNFAIRNESS OF THE SWAN & OTHER COMPANIES IN ALLEG-ING THE CANDLE POWER OF THEIR LAMPS TO BE ACTUALLY WHAT IT PRETENDS TO BE. THE WHOLE POINT FROM OUR VIEW IS CONTAINED IN A PARAGRAPH OF THE LETTER I WROTE TO JOHNSON ON THE 24TH. OF JULY AND WHICH I VENTURE TO REPRODUCE -"THE AVERAGE PUBLIC DO NOT STAY TO ENQUIRE WHETHER IT IS TRUE OR A LIE THAT A LAMP ALLEGED TO BE 20 CANDLES IS OR IS NOT 20 CANDLES" WHAT THE AVERAGE PUBLIC WANT IS ELECTRIC LIGHT AND IN THE SMALL INSTALLATIONS, THEY DO NOT STAY TO EXAMINE VERY CLOSELY INTO THE RELATIVE ECONOMY OF MAINTENANCE OF THE COMPETING SYSTEMS. WHAT THEY LOOK AT IS FIRST COST AND HOWEVER MUCH WE MAY ALL REGRET THE FOLLY & IGNORANCE WHICH ARE THUS EVINCED THE FACT REMAINS THAT WE MUST EITHER CATER FOR THIS FOOLISH IGNORANT PUBLIC IN THEIR WAY OR SUFFER OTHERS WISER IN THEIR GENERATION TO STEP INTO THE BREACH.

THE SWAN LAMPS WERE FORWARDED TO YOU ON THE 2ND INSTANT.

I REMAIN,

YOURS VERY TRULY,

Arnold White

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Grace Street Mills,
Leeds.

Edison Electric Light Co
25th Aug. 1882.

Gent,

Your tender to hand but we are not prepared to expend such a large sum, therefore we will defer for the present Electric Lighting - prices &c may be more favorable in a short time.

(Signed) Grant & Hudson.

THE EDISON ELECTRIC LIGHT SYSTEM.

EDWD. H. JOHNSON,
MANAGER.

57 Holborn Viaduct.

London E.C. 27/8 188

My dr Edison

D M & Co are very anxious to have the light put into Fisk & Hatch's - they inquire of me if it can be done What do you say? - Fottrie says "we especially desire it as we want to accommodate them" - If you say so I will put it in train It should not take long - & it would be a good card - probably do a good deal toward advancing the Stock -

Yours

S W J

answered
Aug 31, 1882

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Aug 28th 1882

T. A. Edison Esq
Menlo Park

Dear Sir

Enclosed please find copy of a letter written by Sir Wm Thompson to Mr Bidwell and sent by Mr Arnold White to Johnson - Johnson handed it to me this morning to send to you after taking a copy to retain in this office -

Yours truly
Edward Lay

answered
aug 31 1882

Telephone No. 346.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C. 17TH. AUGUST 1882.

E. H. JOHNSON ESQ.,
65 FIFTH AVENUE,
NEW YORK.

DEAR SIR,

ANNEXED I BEG TO HAND YOU COPY OF LETTER SENT TO MR. SIDWELL BY SIR WILLIAM THOMSON ON 3RD. JUNE. PLEASE LET MR. EDISON SEE THIS.

I AM, DEAR SIR,

YOURS TRULY,

Arnold White

SECRETARY. pro al

Mott Respective

Forward to Pictorial

Aug 2.82

3

Aug

3RD. JUNE, 1882.

DEAR MR. SIDWELL, MR. SWANS TWO LECTURES OF MARCH AND APRIL 1879 WERE REPORTED IN THE NEWSPAPERS. THERE WOULD OF COURSE BE NO WANT OF EVIDENCE TO PROVE THE PUBLIC EXHIBITION OF THE INCANDESCENT LAMPS AT THE LECTURES. AS A SHAREHOLDER IN THE EDISON CO. I SINCERELY HOPE WE SHALL HEAR NO MORE OF THE LITIGATION WHICH WAS CONTEMPLATED. IT COULD NOT BUT HAVE A MOST INJURIOUS EFFECT ON THE INTERESTS OF THE EDISON CO. THERE NEVER WAS A CASE IN WHICH THE GROUNDS WAS MORE COMPLETELY COVERED BEFOREHAND, AGAINST A WIDE OR GENERAL CLAIM SUCH AS FOR INCANDESCENT CARBON FILAMENT HERMETICALLY SEALED IN VACUUM. IT IS NOT ONLY WHAT SWAN DID THAT MAKES SUCH A CLAIM UNTENABLE. IF YOU LOOK INTO SAWYERS BOOK ON ELECTRIC LIGHTING - SPON, LONDON, 1881 - PAGES 58 AND 59 YOU WILL SEE THAT STARR - OR STARR-KING - IN 1845 LEFT NOTHING PATENABLE BUT THE DETAILS OF SEALING ETC. IN RESPECT OF INCANDESCENT CARBON ROD IN TORRICELLIAN VACUUM FOR ELECTRIC LIGHTING -

ON PAGES 62 & 63 YOU WILL SEE FARMERS LAMP - PATENTED MARCH 25TH. 1879 IN AMERICA - WHICH ONLY WANTED HERMETICALLY SEALING INSTEAD OF INDIA RUBBER STOPPER TO BE SUBSTANTIALLY THE SAME THING AS SWAN WAS SHEWING PUBLICLY AT THE SAME TIME IN ENGLAND.

THE RESISTANCE OF THE LAMP WHICH SWAN SHEWED IN MARCH 1879 WAS PROBABLY TOO SMALL FOR SOME OF THE MOST IMPORTANT APPLICATIONS, BUT CORRECT VIEWS AS TO THE PROPER RESISTANCE WERE GIVEN BY

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., ... 188...

LANE FOX IN HIS PROVISIONAL SPECIFICATION OF MARCH 20TH, 1879. IN THIS SPECIFICATION, WHICH RECEIVED PROVISIONAL PROTECTION ONLY, A COATING OF HARD CARBON DEPOSITED ON OTHER SEMI-CONDUCTING MATERIAL IS DESCRIBED, WITH PROPER ARRANGEMENTS TO OBTAIN A RESISTANCE OF 300 OHMS, AND TO BE MADE INCANDESCENT BY 140 VOLTS - HE DESCRIBES HIS LUMINOUS BRIDGE AS HERMETICALLY ENCLOSED WITHIN A GLOBE OF GLASS, THROUGH WHICH THE CONDUCT--ING WIRES ARE HERMETICALLY SEALED. HE CONCLUDES HIS SPECIFICATION WITH THE FOLLOWING SENTENCE:" FROM THIS GLOBE ALL TRACE OF OXYGEN, CAR--BONIC ACID GAS, WATER AND ANY GAS CAPABLE OF ATTACKING OR AFFECTING THE MATERIAL OF THE LUMINOUS BRIDGE WHEN AT A HIGH TEMPERATURE MUST BE REMOVED." WHAT ELSE IS LEFT FOR EDISON TO CLAIM EXCEPT HOW TO MAKE HIS CARBON FILAMENT?

THE ARRANGEMENTS FOR THE NEW SWAN CO. WERE COMPLETED BEFORE I RECEIVED YOUR FIRST LETTER EXPRESSING A WISH FOR AN AGREEMENT WITH THE SWAN COMPANY.

BELIEVE ME,

YOURS VERY TRULY,

SIGNED: WILLIAM THOMSON.

ELECTRIC LIGHTING ACT, 1882.

Rules made by the Board of Trade with respect to applications for Licenses and Provisional Orders, &c.

Rule I.—No application for a license or for the renewal of a license can be entertained unless proof of the consent of the local authority to such application is given to the Board of Trade.

Rule II.—When applications for provisional orders authorising the supply of electricity within the district of any local authority are received by the Board of Trade from such local authority, and also from any other authority, company, or person, the Board of Trade will give a preference to the application of the local authority of the district in every case where, in the opinion of the Board of Trade, no special circumstances exist which render such a preference inexpedient.

Application and Deposit.

Rule III.—Every application for a license or Provisional Order must be made by memorial signed by, or on behalf of, the applicants, headed with a short title descriptive of the proposed undertaking (corresponding with that at the head of the advertisement herein-after mentioned) addressed to the Board of Trade, and praying for a license or Provisional Order. With the memorial must be deposited six copies of the license or order, as proposed by the applicants, with the schedule or schedules (if any) referred to therein.

Rule IV.—The deposited copies of the proposed license or order must be in print. They must be printed on one side only of the page of paper, so as to leave the back of the page blank, and each schedule annexed must begin a new page.

The names and addresses of the parliamentary agents or solicitors for the license or order must be printed on the outside of the draft.

There must be a notice at the end of the draft, stating that objections are to be made by letter addressed to the Board of Trade, marked on the outside of the cover enclosing it "Electric Lighting Act," and that this letter is to be sent to the Board of Trade within two months from the date of the newspaper containing the first advertisement of the application.

The draft must contain amongst other things—

1. Address and description of the applicants.
2. A description of the proposed area of supply.
3. A statement of the purposes for which a supply is to be given, viz., any or all of the public or private purposes specified in section *three* of the Act.
4. A general description of the proposed works.

Printed for Her Majesty's Stationery Office:
And sold by
P. S. King, King Street, Westminster; Knight & Co., 90, Fleet Street;
Shaw & Sons, Fetter Lane; Hadden, Best, & Co., 227, Strand;
and by
A. & C. Black, Edinburgh; and A. Thom & Co., Dublin.

Price One Penny.

5. Provisions concerning the breaking up of streets not repairable by a local authority and concerning interference with railways and tramways, where powers are sought to be obtained by the license or order for those purposes.
6. Conditions of supply, including price, nature and amount of supply, obligation to supply, &c.
7. Period for which concession is sought.
8. Provisions for securing the safety of the consumer and of the public from injury by shock, fire, or otherwise.
9. Provisions for enforcing the performance by the undertakers of their duties in relation to the supply of electricity and for the revocation of the license or order where the undertakers fail to perform such duties.

The applicants are also to deposit a sufficient number of such printed drafts at offices in London and within the proposed area of supply to be specified in the advertisement, such copies to be there furnished to all persons applying for them, at a price of not more than one shilling each.

Rule V.—There must also be deposited with the memorial,—

A published map of the district on a scale of not less than one inch to a mile, or if there is no published map, then the best map procurable showing the boundaries of the proposed area of supply, the lands which the applicants propose to take for the purposes of the license or order, and the streets and other places in, over, or along which it is proposed to place any electric lines or other works.

A copy of the said map is also to be deposited for public inspection—

In England or Ireland, in the office of the clerk of the peace for every county, riding, or division, and of the local authority of every district,

In Scotland in the office of the principal sheriff clerk, for every county, district, or division, and of the local authority of every district

in which the proposed area of supply or any part thereof is situate.

Rule VI.—There must also be deposited with the memorial,—

1. A list of the local authorities in whose districts the area of supply is situate.
2. A list of the streets not repairable by a local authority and of the railways and tramways (if any) which the applicants propose to take powers to break up.
3. A list of the canals and navigable rivers (if any) which the undertakers will be empowered under the license or order to cross.
4. A statement of the capital proposed to be expended and employed in connexion with the undertaking, and the mode in which such capital is to be provided.
5. If the applicants are a company incorporated under the provisions of the Companies' Acts, a copy of the memorandum and articles of association.
6. A fee of 50*l.* by cheque payable to an "Assistant Secretary of the Board of Trade" to cover ordinary expenses. If in consequence of inquiries or otherwise additional expense is incurred, the amount will be charged to the applicants and must be paid by them in addition to the ordinary fee.
7. Where the undertakers under any license, order, or Special Act desire the consent of the Board of Trade to enable them to break up any street not repairable by a local authority or any railway or tramway which they are not empowered to break up under such license, order, or Special Act, the memorial must specially request such consent and must describe accurately the street, railway, or tramway which they propose to acquire power to break up.

Rule VII.—Where the approval or consent of any local authority is required to any application for a license or order, such approval or consent must be given by a resolution passed at a special meeting of the local authority held after one month's previous notice of the same, and of the purpose thereof, has been given in the manner in which notices of meetings

of such local authority are usually given, and the fact that such a resolution was duly passed must be proved by furnishing a certificate signed by the secretary or clerk to such local authority embodying copies of the notice and of the resolution, and certifying that the notice was duly given and the resolution duly passed.

Rule VIII.—In any case where a local authority, company, or person is required by the Act to give notice to the local authority of the district, "in "such manner as the Board of Trade may direct or approve," such notice shall be given in writing, and shall be served, either by leaving the same at the offices of the said local authority on or before the appointed day or by forwarding the same by post in a registered letter so that the same would in ordinary course of post be delivered on or before the appointed day.

Procedure where Application is entertained.

Rule IX.—If the application is entertained by the Board of Trade, the applicants must proceed as follows:—

They shall publish notice by advertisement that such application has been made.

Every advertisement shall contain the following particulars:—

1. The objects of the application.
2. Address and description of applicants.
3. A general description of the nature of the proposed works.
4. A description of the proposed area of supply.
5. The names of the streets and other places in, over, or along which it is proposed to place any electric lines or other works.
6. A list of the streets not repairable by a local authority and of the railways and tramways (if any) which the applicants propose to take powers by the license or order to break up.
7. A list of the canals and navigable rivers which the undertakers will be empowered under the license or order to cross.
8. An office in London, and another office within the proposed area of supply, at which printed copies of the draft license or order when applied for, and of the license or order when made, can be obtained at a price of not more than one shilling each.

The advertisement is to be headed with a short title, descriptive of the undertaking (corresponding with that at the head of the memorial), and it must state that every local or other public authority, company, or person desirous of making any representation to the Board of Trade, or of bringing before them any objection respecting the application, may do so by letter addressed to the Board of Trade, marked on the outside of the cover enclosing it "Electric Lighting Act," within two months from the date of the newspaper containing the first advertisement.

The advertisement is to be inserted, once at least in each of two successive weeks in one and the same newspaper, published and circulating in the proposed area of supply, or in such other newspaper as the Board of Trade may direct; and once at least in the London, Edinburgh, or Dublin Gazette, accordingly, as the proposed area of supply is situate in England, Scotland, or Ireland.

Rule X.—In all cases of applications for a license, renewal of license, or Provisional Order, to which objection is made by any person locally interested, the Board of Trade will, if either the applicants or the objectors so desire, hold a local inquiry of which due notice will be given.

Rule XI.—If any local or other public authority, company, or person, desires to have any clauses or other amendments inserted in the license or order, they must deliver the same to the parliamentary agents or solicitors for the order, and also to the Board of Trade on or before the time limited for bringing objections.

Rule XII.—When a license or Provisional Order is ready, and before the same is delivered, the applicants must deposit at the office of the Board of Trade a description of the lands (if any) which they propose to purchase for the purposes of the license or Provisional Order, and must produce to the Board of Trade the contracts for the purchase of all such lands.

Rule XIII.—When a license or Provisional Order has been made by the Board of Trade and delivered to the applicants, they shall forthwith deposit printed copies for public inspection in the offices specified in Rule V., and shall supply copies to all persons applying for the same, and shall further publish the same as the Board of Trade may direct.

Special Provisions as to Provisional Orders.

Rule XIV.—In the case of Provisional Orders the following additional regulations must be observed.

1. The advertisements must be inserted in *October* or *November*.

2. A copy of the advertisement and map must be deposited *on or before* the 30*th November* in the offices specified in Rule V., and at the Board of Trade.

3. The Memorial must be lodged on or before 21*st December*.

4. The parliamentary agents or solicitors for the order must be prepared to prove compliance with the provisions of the Act and these rules by the 25th January and all such proofs must be completed on or before the 25th February. Six days' notice will be given of the day and hour at which such agents or solicitors are to attend for the purpose at the Board of Trade, and printed forms of proof will accompany the notice. These forms should be filled up and brought with the requisite documents to the Board of Trade at the time fixed for receiving proof.

Rules of Board of Trade

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The Board of Trade,
August 1882.

T. H. Farrer,
Secretary.

LONDON:
Printed by George E. B. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.
[8497.—1000.—8/82.]

Enclosure

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., Septr 5th 1882

Dear Sir,

I am desired to enclose you copy of letter addressed to Mr Johnson by this mail on the subject of the drawing facilities hitherto extended to you - The Board are fully of opinion that it is not by your wish or that of Mr Johnson that articles are included in the consignments to England which have not been ordered by the Company - It is with regret, therefore, they have been compelled, in the interests of their Shareholders, to decline to accept a draft for the "L" Armatures which have not been ordered - The Board further trust that you will give instructions to the officials entrusted with the execution of the Company's Orders strictly to comply in future with the terms of the respective indents.

I am,

Dear Sir,

Yours truly

Amola Thule

Secretary

T. A. Edison Esqre

Menlo Park

New Jersey U.S.A.

[ENCLOSURE]

Enclos.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 5TH SEPT. 1882.

E. H. JOHNSON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

SOCKETS.

ENCLOSED I BEG TO HAND YOU STATEMENTS IN REFERENCE TO SOCKETS, FROM WHICH YOU WILL SEE THAT MESSRS BERGMANN HAVE OVER-DELIVER--ED THESE TO THE NUMBER OF 5503 - VALUE £1046. 7. 11. IN OUR ORDER NO--THING WAS SAID ABOUT EACH FIXTURE HAVING A SOCKET SUPPLIED WITH IT, INDEED BERGMANN'S PRICE LIST ON PAGE 5 STATES THAT SOCKETS ETC. ARE NOT INCLUDED IN THE PRICES OF ELECTROLIERS OR BRACKETS. AS THE COMPANY WILL SHORTLY BE ABLE TO PURCHASE THE ACORN SOCKET HERE AT ABOUT 20 CENTS EACH THEY ARE IN THE POSITION OF HAVING HAD THRUST UPON THEM A LARGE QUANTITY OF ARTICLES, NOT ORDERED BY THEM AND AT AN EXCESSIVE PRICE.

PERHAPS YOU WILL THEREFORE BE GOOD ENOUGH TO INTIMATE TO MESSRS BERGMANN THAT THE COMPANY WOULD BE OBLIGED BY THEIR REMITTING DRAFT FOR £1046. 7. 11., AND THE AMOUNT OF GOODS DELIVERED IN EXCESS SHALL BE PACKED AND RETURNED TO THEM.

THE DIRECTORS WILL HAVE SERIOUSLY TO CONSIDER WHETHER THE GREAT DRAWING FACILITIES PRESENTLY ENJOYED BY MR. EDISON SHOULD NOT BE

[ENCLOSURE]

RESCINDED, SHOULD THE DRAWING ON ACCOUNT OF GOODS NOT ORDERED, OF WHICH THIS IS AN EXAMPLE, BE CONTINUED.

I AM, DEAR SIR,

YOURS TRULY,

SECRETARY

2. ENCLOSURES.

P.S. SINCE WRITING THE ABOVE A BILL HAS BEEN PRESENTED FOR £1107. 1. 0. WHICH INCLUDES AN ITEM OF £679. 0. 3. FOR 12 L ARMATURES WHICH ARE REPORTED BY THE STORES DEPARTMENT AS NOT BEING ORDERED BY THE COMPANY. AFTER FULL CONSIDERATION THE DIRECTORS CAME, WITH REGRET, TO THE CONCLUSION THAT THEY COULD NOT ACCEPT THIS BILL AND A CABLEGRAM HAS ACCORDINGLY BEEN DESPATCHED TO MESSRS DREXEL MORGAN TO THAT EFFECT. THE LETTERS WHICH HAVE REACHED YOU DURING THE PAST THREE MONTHS WILL HAVE SHOWN YOU THAT IT WAS ABSOLUTELY UNNECESSARY TO SEND 12 SPARE ARMATURES FOR L MACHINES OF WHICH WE ALREADY HAVE IN STOCK 48.

[ENCLOSURE]

Summary of Sockets.

Description	Quantity Ordered	Quantity Delivered	Quantity to be delivered	Quantity delivered in excess.
Japanned with Keys.	125		125	
Bronzed "	125	200		75
Pol: Brass "		3404		3404
Gold Bronze "	50	595		545
Japanned no Key.	500	225	225	
Bronzed "	150	225		75
Pol: Brass "	250	1652		1402
Gold Bronze "	100	102		2
Johnson Acorn.	500	500		
Spike with Key	10	10		
Hook "	10	10		
Slide "	10	10		
	1830	6933	350	5503
Delivered in excess.				
Bronzed with Key	75	@ 85	$ 63.75	
Pol: Brass "	3,404	@ 1.06	3608.24	
Gold Bronze "	545	@ 1.10	599.50	
Bronzed without Key	75	@ 28	21.00	
Pol: Brass	1402	@ .53	729.06	
Gold Bronze	2	@ 57	1.04	
	5503		$5022.69 = 4/2	£1046.7.11.
Yet to be delivered:				
Japanned Keys	125	@ 85	106.25	
" Do without	225	@ 28	63.00	
	350		$ 169.25 = 4/2	£35.15.3.

[ENCLOSURE]

Statement re Sockets.

Invoice date	With Keys.				Without Keys.			
	Japanned	Bronze	Pol: Brass	Gold Bze	Japanned	Bronze	Pol: Brass	Gold Bze
June 23.			17.00	50			50	
" 27.			972	168				
"				360	225		200	100
July 21			19				500	
Aug: 1.							50	
"			466				150	
"			20				350	
"			19				50	2
"			30				2	
"			6				100	
"		200					200	
19.			87					
"			24	12				
"			9	5				
"			30			225		
"			13					
"			9					
		200	3404	595	225	225	1652	102

(No. 26)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Caprington Colliery
Kilmarnock. 7th Septr 1882.

Messrs The Edison Electric Light Coy Ltd.
74 Coleman Street.
London. E. C.

Gentn,

I have to acknowledge with thanks the receipt of your letter of 29th Ultr with estimated cost of Installation of Electric Light at Caprington Castle enclosed; Mr Cuningham is not inclined to go to the expense, in the mean-time but should his private Gas Works require an extensive over-haul which it will in all liklihood require before long. ~~He~~ he will again consider the matter. Thanking you again for the great trouble you have taken in this matter

I am, Gentn
Yours truly,
(Signed) Hugh. S. Dunn.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 9TH SEPTEMBER, 1882

T. ALVA EDISON ESQ.,
MENLO PARK,
NEW JERSEY,
U. S. A.

DEAR SIR,

HAVING REGARD TO THE AMICABLE RELATIONS WHICH HAVE ALWAYS SUBSISTED BETWEEN YOURSELF AND THE COMPANY, THE DIRECTORS HAVE RESOLVED TO ACCEPT THE BILL FOR £1107.1.0. WHICH HAS ACCORDINGLY BEEN DONE TODAY. I AM HOWEVER TO REQUEST THAT YOU WILL CREDIT THE COMPANY WITH THE FOLLOWING AMOUNTS.

100 - 10 C.P. LAMPS AT $2 -	200	
300 - 10 C.P. ,, AT . 75 -	225	
	425	
CONTRACT PRICE 50 C		
400 LAMPS AT 50 C	200	
		225.00

SOCKETS AS PER STATEMENT

SENT MR. JOHNSON 5TH SEPTEMBER, 1882

£1046.7.11 AT 4.86		5085.48
3 K ARMATURES NOT ORDERED AT $405.	$1215	
12 L ,, ,, ,, AT 275	3300	4515.0.0
		$9825.48.

THE SOCKETS & ARMATURES ARE HELD AT YOUR DISPOSAL AND ON OBTAINING YOUR RECEIPT FOR THESE AMOUNTS AS ADVANCED AGAINST THE MACHINERY ORDERED, BUT NOT YET DELIVERED, THE DRAWING FACILITIES YOU HAVE HITHERTO ENJOYED, BUT WHICH ARE NOW SUSPENDED, CAN BE REVIVED. THE DIRECTORS ARE CONVINCED THAT NEITHER YOURSELF NOR MR. JOHNSON ARE AWARE OF THE FACT OF GOODS NOT ORDERED BEING SENT FORWARD AND DRAWN AGAINST UNDER THE DRAWING FACILI-TIES ENTRUSTED TO YOU, AND IT WAS ON THIS ACCOUNT THAT, AFTER FULL CON-SIDERATION, THEY FELT UNWILLING TO SUBJECT YOU TO ANNOYANCE OR INCON-VENIENCE IN REFERENCE TO THIS MATTER.

I AM, DEAR SIR,

YOURS TRULY,

Imola Mill

SECRETARY.

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Sept 9.82

Lorain Co

The Edison Electric Light Company, Limited,

74 Coleman, Street,

To the Board. London, E.C., Sept. 11th, 1882.

Report

on the

condition of No. 2 dynamo.

Gentlemen:-

In accordance with instructions received from the Board on Thursday last Sept. 6th, that a thorough inspection was to be made of the armature and commutator of No. 2 dynamo I proceeded on Thursday afternoon to commence dismantling the machine.

In the first place a series of electrical tests were made which seemed to indicate the high probability that the insulation of the armature was imperfect.

It will be in the recollection of the Directors that in the report I handed them on the accident at Holborn Viaduct, I pointed out that No. 2 is not as good a machine as No. 3. The commutator of No. 2 machine is not as long as that of No. 3 and the brushes are not as wide. Hitherto when No. 2 machine has been run we have always had more trouble with the brushes due to sparking and heating, but this did not lead us to suspect any electrical defect in the machine. We have never run upon it the maximum number of lights, we were told it would carry, namely 1000, because we have not had that number on the circuits, but we assumed that the statements that have been made about it were correct and that it would if necessary carry this load.

The electrical tests applied to it only showed us that

the insulation somewhere in the armature, or commutator was not as good as could be desired but did not enable us to locate any particular fault, and we never had the opportunity of taking the commutator to pieces, seeing that this would have required more time than is allowed by the interval between two runs.

Nothing short of actual inspection could have enabled us to see whether or not the armature was in a sound condition. The experience of August 31st, showed us that the machine was not equal to accepting the sudden load of 600 to 700 lights thrown upon it.

On Thursday afternoon the armature was lifted off its bearings, and the commutator separated from the armature.

A series of careful electrical tests were then applied which showed that the insulation of the bars on the armature was perfect, and also the insulation of the plates, but that the insulation of the commutator bars was exceedingly defective. It is to be noticed that these tests could not be applied until the commutator and armature were separated from one another, and it was evident that it was necessary to take the commutator entirely to pieces.

The commutator bars having been unscrewed and the interior disclosed I found a very serious state of things.

The commutator bars are separated from one another by mica and the bars themselves are separated from the cap at the end also by mica. In the first place the oil used on the bearings had crept in under the cap, and saturated the interior and

pentrated into the mica. In one place the mica was burnt away, and a small hole fused out of the iron.

The general appearance seemed to indicate that the mischief had been done at some time, when a heavy load had been run on the machine. Since I have had charge of the machines we have never run upon it more than 400 to 500 lights, and we have never experimentalized upon it.

We have been so much better satisfied with No. 3 that it has always done the work.

The manner in which the mica was put in between the plates was not satisfactory, and I am informed that gum was used in sticking together the mica.

When the machine first came over and I received charge of it, we were instructed to use amalgam of mercury made up with nitric acid; but I have since abandoned the use of this believing that it is injurious to the commutator.

If however this was used in America before the machine came to us the damage may have begun there. I am informed that at the time when the machine was set up there the bearings used to get very hot, and ice had to be liberally applied. These things seem to indicate to my mind that the commutator was not in a perfect condition when we received the machine.

I hope to be able to report in the next two days that the commutator had been reconstructed with perfect insulation meanwhile I wish to lay before the Board two suggestions. 1st. That every station dynamo should be tested in America by Mr. Edison

with the maximum number of lights which it is intended to carry for a sufficient time say 4 or 5 hours. 2nd. That after running a sufficient time to develope any latent faults, a series of electrical tests should be applied to it to show that the insulation still remained perfect, and that a certificate be given with every dynamo on those two points, FIRST. That it has actually run with the maximum number of lights upon it, and SECONDLY that its insulation after this is perfect, because it is not easy for us on receiving a dynamo to take its armature and commutator to pieces and ascertain by inspection whether or not it is in a perfect condition because it may stand the electrical tests made with a galvanometer yet actually running powerful currents may develope certain faults to such an extent that the machine will break down if a little extra load is suddenly thrown upon it.

Sept. 13th 1882.

The commutator has been, since writing the above completely reconstructed. Fresh good mica has been inserted and each piece carefully tested. A ring of asbestos paper soaked in shellac has been applied inside the cap of the commutator to prevent access of the oil.

The commutator has been fixed again in its place and a modification made in the brush holders which renders it impossible to change a brush during a run. The vulcanized fibre which was used for insulating washers, and which is worthless as an insulator when damp has been replaced by ivory and paraffined wood, and the insulation thereby greatly improved. This afternoon after

most careful tests the dynamo was started at 4.15 P.M. and at the present moment is running most satisfactorily. I can now report to the Directors that both machines are now in excellent order and I shall make such experiments on No. 2 dynamo as will give assurance that it is equal to the emergency in case a sudden change is required.

I am, Gentlemen,

Your obedient servant,

Signed, J. A. Fleming.

[TO ARNOLD WHITE?]

12 th. September! 1882.

The Secretary,

Edison Electric Light Co.

74 Coloman St.

London, England.

Dear Sir:-

I duly received your favor of 24th. August.

I would point out to you that my estimate for a 80 light plant was made to be compared with your estimate of net cost of same and I in no wise fell into the error of estimating the net cost of a plant "to the Company not even in London, but "in New York, in the case of the Edison Co. with the gross price "including profit charged by the Swan Co."

My estimate was made on the basis of packing and shipping expenses on this side being paid by me - you being charged with the freight and insurance for which there is a margin in the case of the dynamo of £2,16,8. My estimate is simply one of cost to you in London as compared with your estimate of cost to you there. From a paragraph in one of your letters to Johnson as to the preparation of this estimate I gain the impression that it is your idea that the estimate was not carefully prepared, which is certainly not justified as it was based on my figures worked out with the object of seeing whether I could not deliver D dynamos F. O. B. in port of London in case of large orders. It is my impression after reading your letter and again looking over my estimate that your examination of the latter could not have been

very great or else you would have discovered that I did compare "like with like" viz., the net cost of an Edison 80 light plant delivered in London.

I did not mean to give you the impression that we can dispense with electroliers - which I allowed for in my estimate. What I meant you to understand was that however necessary we might the electroliers manufactured here it would be better policy to use those made in England in order to cheapen our plant. To sum up my figures I would state that where so poor a ~~plant~~ machine as the Burgon is used it is possible for you to put in one of our plants at cost at a loss of about £2,0,0 where no engine and boiler is required, and where your customer requires the latter articles you can certainly make a small profit in consequence of the economy of my lamps and dynamos as compared with those of my opponents so far as power is concerned. If a better machine than the Burgon is used (the Siemens) you can make a gross profit of at least 25 per cent. I therefore consider your loud complaints in your letters to Mr Johnson as to the ruinous cost of your machinery not only far fetched but scarcely in accordance with the facts of the case. We have had to meet here with the same competition and in the course of about eight months we have not only killed it but have earned profits amounting to a sum equal to our cash capital plus 7 per cent. Mr Olrick's remarks to the effect that we have had no such competition as yourself are exactly the opposite to the facts of the case as we have had competition of the most severe character, which we havemmanaged to

kill and have made money in doing so and I am extremely disappointed at your complaints that you cannot follow in our footsteps.

Referring to your letter of 18th. August to Mr Upton I would remark that the ten candle lamps sent you were but samples and were made by hand and were necessarily very expensive. In such cases it is our practice to charge our customer with one half and bear the balance of the cost ourselves. Of course when we make these lamps as regular articles of manufacture the cost will be very considerably reduced and we are now preparing tools with the view to achieving this object. If however you prefer it I will in the future refrain from sending you any new fariety of lamp until they can be turned out at the bottom price which in every instance will be long after the first samples have been produced by hand. It is for you to decide whether you want this course pursued it being quite immaterial to me as I am glad to say my other companies both at home and abroad are only too anxious to get samples of everything new I may turn out (with a view to improving our system) irrespective of immediate cost trusting in my ability and desire to cheapen the manufacture later on.

From your letter to Mr Upton I gather that it is your opinion that I am compelled to supply your company with lamps of whatever character and candle power at 40 cents for "General Distribution" and 50 cents for "Isolated". If I am right in my conjecture I must say that I xxxxxx entirely dispute your assumption as I fail to see that the contract gives you any such

ight. At the time the contract was made the only lamps of regular manufacture were of sixteen and eight candle power for " general Distribution" and " ~~xxxx~~ "Isolated" purposes. I am now working on a 32, 50 and 100 candle power lamps and it would be absurd to expect that these can be made at the same price just as it would be absurd for me to undertake to supply them at the same price as the 8 and 16 candle lamps. I am also working on a higher resistance lamp with the object of reducing the investment in conductors. This lamp may prove expensive to manufacture and yet economical for your Company to purchase at say twice the present cost of our regular lamps. It would be as impolitic for you as for me to have such a one sided arrangem ent as to price of lamps, as you assume exists as it could not but deter me from further investigation in the fear that I might devise a lamp expensive to manufacture but yet economical to use.

I must protest against the spirit which seems to underlie your letter to Mr. Upton and more especially your letters to Mr Johnson. My object has always been to endeavor to cheapenthe manufacture, increase the variety, and add to the completeness of everything in connection with my system and I must confess to a feeling of disappointment at finding, for the first time, that those associated with my enterprises of Electric Lighting in England do not seem(judging from your letters) to encourage my efforts in this direction.

As to the extra "L" armatures sent you I would point out to you that you accepted the "L(150 light) machines sent to you instead of 100 light machines and it was but natural that I should

presume that you would require extra armatures for the same, as I have not yet found that an XXXXX armature will last forever and that it is impossible to have an accident with them. It is however a matter of little moment to me whether you keep the armatures or not, the question involved being not whether you or I were in error as to them but whether my credit with my Bankers should be impaired, considering the nature of my authority from you to draw it would have been but mere business courtesy for you to have met the draft and cabled me to reimburse you the disputed amount, in the first case instead of leaving it unpaid for several days. I do not know what may be the business usage under such circumstances in England but in this country this course is invariably pursued where relations such as those between us exist. I have already paid out an amount about equal to the sum in dispute (for which accounts go forward by this mail) and in consequence of your orders not to draw on your Company again till I hear from you by letter I shall be compelled to pay, for goods shipped, from my personal funds as our various establishments have my personal order for the goods shipped and to be shipped to you.

I shall be glad to know if it is the intention of your Company to again refuse to honor my Drafts on them in the manner pursued in this case , as if so I shall be obliged to request that my bills against you be paid in New York <u>in cash</u> as I cannot afford to allow any doubt as to whether my drafts on you will be honored as I sell them to my Bankers through whom I am constantly drawing on all my Foreign correspondents, nor can I expect my Bankers to negotiate them for me if such a doubt does exist.

From your letters mainly to Mr. Johnson I gain the impression that you imagine that it is my desire to force on you the product of our factories here. I wish to disabuse your mind of any such idea and would add that I shall be equally as pleased as yourself when your Company can get their Lighting apparatus manufactured in England equally as good and cheaper than we can ship it from here.

Yours truly,

(Signed) Thomas A. Edison

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 12TH SEPT. 1882.

T. A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY. U.S.A.

DEAR SIR,

ENCLOSED I BEG TO HAND YOU ORDER FOR 100 LAMPS OF 2 TO 5 CANDLE POWER, E.M.F. ABOUT 40 VOLTS. THE COMPANY HAD AN ENQUIRY YESTERDAY FOR 2000 LAMPS OF 4 TO 6 CANDLE POWER, VOLTS AS LOW AS POSSIBLE; AND THERE SEEMS TO BE A CONSIDERABLE DEMAND FOR THIS CLASS OF LAMP. BE GOOD ENOUGH TO LET US HAVE THE 100 NOW ORDERED AS SOON AS POSSIBLE AND SAY WHETHER YOU COULD FILL AN ORDER FOR THE 2000 REFERRED TO. SUCH A LAMP SHOULD BE ADAPTED FOR RUNNING WITH THE E MACHINE AS A DYNAMO, AT A SPEED OF SAY - FROM 800 TO 900 REVOLUTIONS.

PLEASE PRESS FORWARD DELIVERY OF THE 25 SQ-LIGHT METERS NOT YET ADVISED. THESE ARE URGENTLY WANTED FOR OUT CONSUMERS ON THE VIADUCT.

WE HAVE NOT YET RECEIVED THE TEMPLATE OF THE LARGE DYNAMO FOR WHICH WE HAVE CABLED AND WRITTEN SEVERAL TIMES.

I AM, DEAR SIR,

YOURS TRULY,

Arnold White

SECRETARY

ENCLOSURE

Provisional Orders

List of Authorities to whom Notices were sent 13th September, 1882.

Acknowledged	To be submitted	Declined	Will apply themselves	Further information asked for
Provincial				
Bath	Hove	Bradford	Birkenhead	Croydon
Folkestone	Ipswich	Darlington	Coventry	Sheffield
Hull	Leeds		Dewsbury	
Oxford	Liverpool		Dover	
Scarborough	Southampton		Huddersfield	
Sheffield	West Hartlepool		Nottingham	
Tynemouth			Worcester	
			Sheffield	
Scotland & Ireland				
Belfast		Edinburgh	Dundee	
			Glasgow	
			Kinning Park	
Metropolitan				
	Fulham			St. George's S.W.
	Kensington			St. Pancras
	St. Luke's			Chelsea
	St. Martin in F.			Greenwich
	St. Mary, Islington			
	Whitechapel			
	Wandsworth			
	Lewisham			
	Mile End			
	Clerkenwell			

85 Authorities from whom no communication has yet been received.

28/9/82.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 14TH SEPT. 1882.

T. A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY.

DEAR SIR,

DYNAMOS.

WE RECEIVED FROM YOU RECENTLY WORKING DRAWINGS OF THE L DYNAMO, BUT NOT OF THE Z FOR WHICH WE HAVE SEVERAL TIMES ASKED. WE PARTICULARLY DESIRE THE Z DRAWINGS TO ENABLE US TO GET QUOTATIONS FROM ENGLISH FIRMS FOR THE MANUFACTURE OF THIS MACHINE WHICH IS ONE OF THE MOST USEFUL SIZES OF DYNAMOS. YOU ARE QUITE AWARE HOW MUCH THE PROGRESS OF THE COMPANY DEPENDS UPON OUR HAVING A READY SUPPLY OF GOOD DYNAMOS AT THE LOWEST COST, AND WE HAVE REASON TO BELIEVE THAT THEY CAN BE MADE HERE MORE CHEAPLY THAN IN AMERICA. IT IS HOWEVER ESSENTIAL BOTH FOR THE REPUTATION OF YOUR SYSTEM AND FOR OUR SUCCESS THAT THEY BE MADE IN AN EFFICIENT MANNER, AND WE SHALL THEREFORE FEEL OBLIGED BY YOUR GIVING INSTRUCTIONS TO HAVE FULL WORKING DRAWINGS OF THE Z MADE AND SENT BY MAIL AS EARLY AS POSSIBLE.

ON THE L DRAWINGS THE MACHINE IS TERMED 125 LIGHT, BUT THIS IS PRESUMED TO BE A CLERICAL ERROR, AS WE UNDERSTAND IT TO BE OF 150 LIGHTS CAPACITY IN ACCORDANCE WITH YOUR CABLEGRAM OF 23RD JULY CONFIRMED UNDER DATE 1ST AUGUST.

I AM, DEAR SIR,
YOURS ~~TRULY~~,
Mcclarkie
SECRETARY

Mess. Mather & Platt refuse to lend us drawings for the purpose of encouraging Competition

COPY

4 Westminster Chambers,

15th, Sept. 1882.

The Directors of the Edison Electric Light Company.

Gentlemen:-

I have made several inspections of No. 2 dynamo during the time it has been dismantled and have also seen it running since the repairs were completed. I have read Dr. Fleming's report of the 11th, and 13th, inst.

No. 2 dynamo is now a better machine than when it left Mr. Edison's works as the insulation of the Commutator was then carelessly made with inferior materials which materials have now been carefully replaced with the best obtainable.

It will be within your remembrance that No. 3 machine broke down in a precisely similar manner before the machinery was fully under Dr. Fleming's care; also, that at an earlier period, before the actual formation of the Company I think, an accident once occurred when the change from one machine to the other was being demonstrated. It is to my mind most probable that the insulation of both machines was injured on that occasion.

I agree with Dr. Fleming's recommendation that Mr. Edison should be asked to test the dynamos before they are sent to us.

I am glad to find that the heating of the bearings which had been a bar to the continuous running of No. 2 machine has ceased. Ice has previously been used to keep these bearings cool; this is really a desperate remedy only permissible in emergency; if no remediable defect can be detected in a hot bearing the right course is to run slowly with small load till the evil disappears

as it is usually found to do.

The practical limit to the capacity of No. 2 machine is now the power of the brushes to carry off the current.

I am, Gentlemen,

Yours respectfully,

Signed, I. Hopkinson.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 16TH SEPTEMBER, 1882

T. A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY,
U.S.A.

DEAR SIR,

C. DYNAMO

BE GOOD ENOUGH TO GIVE INSTRUCTIONS THAT NO BRUSHES BE SENT WITH THIS MACHINE, AS WE CAN PURCHASE THEM HERE AT 33 PER CENT LESS THAN THE AMERICAN PRICE.

I AM, DEAR SIR,

YOURS TRULY,

A. Dalyplein
for SECRETARY.

56 W 12th St.
N York Sept 27th 82

My dear Edison

This I find among my English Papers which I have today been filing away permanently (in my new Desk) - I return it to you as the impression is with me that you remarked the other night in conversation that you didn't authorize the Royalty of Siemens - or something of that effect

Yours

E. Johnson

[ENCLOSURE]

Eug - Tell

When you get there
Consult Fabbri Etc. &
go to Com Siemens ask him
if he considers his English
patent on Dynamo Valid
if so ask what royalty
he wants from us on
60 Light machine we
making Machine, if royalty
not over 50 on small
& 150 on Large, we wont grumble

[ENCLOSURE]

but if he will make no arrangement say very well we will make other arrangements.

My impression is that he point invalid, & the expert could not (run) speculate + that there is ~~reference~~ publication of an Electromotor previous to his application

Telephone No. 846.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 18TH SEPT. 1882.

T. A. EDISON ESQ.,
65, FIFTH AVENUE.
NEW YORK.

DEAR SIR,

ENCLOSED WE BEG TO SEND YOU OUR ORDER NO. 593 FOR 50 CANDLE AND 10-CANDLE LAMPS. YOU WILL PERHAPS BE GOOD ENOUGH TO LET US HAVE DELIVERY OF THESE GOODS AT YOUR EARLIEST CONVENIENCE. WE SHALL ALSO BE PLEASED TO LEARN THAT YOU ARE ABLE TO INVOICE THE LAMPS AT LOWER PRICES THAN THOSE NAMED IN THE ORDER.

I AM, DEAR SIR,

YOURS TRULY,

N. S. Lyle

ACTING SECRETARY.

ENCLOSURE.

Upton refuses to supply for 50 lamps not according to agreement

(No. 25)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Memorandum. Septr 19th 1882.

From
Pool Wall Mills,
Taunton.

To.
Edison Electric Light Coy

Gentn

I have given up all idea for the present; the cost is much too great.

Yours faithfully
(Signed) C. Smith.

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Swan Yard Drapery,
Northampton
19th Septr 1882.

Dr Sir,

In reply to your enquiry the writer failed in his endeavour to get the Electric Light tried at the Duston Avenue, mainly on the grounds of expense.

The estimate of another Company we may inform you was much under yours.

We are,
Yours faithy
(Signed) Pressland & Son.

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Memorandum

Septr 19th 1882.

From
Hughes & Kimber, Ltd.
West Harding St, Fetter Lane,
London. E.C.

To. The Edison Electric Lt. Coy
74 Coleman St.

In reply to your letter of yday, we have to inform you that we have decided to light our Works by a much cheaper method than the Electric light is as yet estimated to cost.

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Time Works,
Barr St. West, Hockley.
Birmingham. 19. Septr 1882.

Dear Sir,

In reply to your favor to hand this morning - I consider the expense too great for the result obtained viz: for lighting one room.

Yours resply,
pro W. Eberhardt.
W.M.

The Sec^y.
Edison Electric Light Co Ltd.
74 Coleman Street
London.

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Benthall Works,
Broseley, Shropshire.
Septr 20th 1882.

The Secretary,
Edisons Electric Light Compy
74 Coleman Street. E.C.

Sir,

In reply to your letter of the 18th inst. we beg to say that in consequence of the greater amount of your Estimate over that for lighting by gas we are compelled to relinquish the idea of adopting Electric Light - at all events for the present.

We are, Sir,
Yours truly
(Signed) Maw & Co.

(No. 25.)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Princess's Theatre,
Glasgow.
20th Septr 1882.

To
Secretary,
Edison Electric Light Co.

Dear Sir,

Yours of 18th to hand. I have received no official communication from the Proprietor of this Theatre that he will not join with me in using your light, but I fancy he considers the outlay too much. I will write him tonight & unless you hear from me by end of this week you may conclude its off.

Yours truly,
(Signed) H. Cecil Beryl.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 21ST SEPTEMBER, 1882

T.A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY. U.S.A.

DEAR SIR,

I BEG TO CONFIRM CABLEGRAM TO YOU OF THIS DATE AS FOLLOWS:-

"HYDROMETER BROKEN SEND DUPLICATE BETTER PACKED."

THE HYDROMETER ARRIVED YESTERDAY BUT UPON BEING UNPACKED WAS FOUND TO BE BROKEN, APPARENTLY BECAUSE THE PACKAGE WAS TOO SMALL FOR SUCH A FRAGILE ARTICLE. DELIVERY WAS THEREFORE REFUSED. BE GOOD ENOUGH TO LET US HAVE ANOTHER AT YOUR EARLY CONVENIENCE.

I AM, DEAR SIR,

YOURS TRULY,

Imola Wilks

SECRETARY.

Acknowledge receipt & say another hydrometer has been shipped

Care Stevens, 4 Trafalgar Square.

London, Sept. 21st, 1882.

My Dear Johnson:-

Returning from Southampton, I find no letter from you, so suppose you are so busy with the Central Station that you have not the time to write. I cannot well help writing you about the waysthe Company's affairs seem to look here. I do not go to the office as much as formerly, but I cannot but notice the fact everything seems dead at 57, and were I a Shareholder there would soon be a row. I do not need to apologize to you for any criticism I may make. The Company's business here of course does not affect me pecuniarily or otherwise, but I have that faith in Edison's system, that desire to see it properly extended, that it hurt's me to see golden opportunities thrown away, splendid chances lost, through the supineness andselfishness of those on whom the immediate success of the Company depends--through the neglect of duty on the part of those to whom the work has been intrusted.

I had hoped, and you and Edison had also, after the energetic and successful launching of the Company last winter, the establishment of the 57 Station, and the good work at the Palace, would come an active and prosperous business, and so there should. But what are the facts? I go to 57, and I see in your old office Hammer, occasionally despondent, working away at some estimate, Scott debating the cost of some dozen or less petty fixtures, and Glover perhaps penning some 30 s man's dismissal in order that another may be found for 26. One other is sometimes present- Fleming- but he is at heart thoroughly given to insulite, and

half the remainder at 74 consulting with White about it. spends half his time away from the office attending to it, He has developed no business capacity whatever, and White instead of staying in the position you delegated him to, that of Secretary, is practically Manager, while old Bouverie is more interested in debentures and Egyptian Bonds than Electric Light. But the fault lies with Fleming and White . The latter is more active in defeating any good tender by his damned legal cuteness than he is in advancing the interests of the Edison Electric Light Company. The Company is doing nothing at all. No Company ever started under more favorable circumstances, none ever had better opportunities than this one, but it seems as if everything is being thrown away. Witness the "Alaska" which they might have lighted; the Holborn restaurant, the neglect to light which will be one of the worst possible blunders; it is one of the most finely fitted buildings in London. Gordon is not exacting, and Verity has worked hard for it. The Westminster affair is very apt to fall through. Another false move is the going into the Aquarium Exhibition, for which they are to be paid, but at which they are simply the bait to tempt , or the lever to move other companies. With proper management they might have two or three hundred linemen at work, and more orders that they could fill. Thousands of people want the Light, but are met by a dilly-dallying policy which disgusts and maddens them. What the Company wants is an active, competent, manager, who can put his foot on White and Fleming to keep them in their place, and if they have more interest in insulite than electric lighting then they should find their

business there, for the interests of the Company are so great, and the time too pressing to be trifled with. Now these are facts. They are not the reflections of any one man, but I am not deafnor blind, and can see for myself what is going on, and I must say that no more suicidal policy can be adopted than that at present pursued by the Company, nor can any greater mistake be made than trusting to favorable patentsissues rather than a sound business basis. So much about the Company. I know it is not pleasant news, but Quixotic as it may seem to others, I think you will believe me when I say I have your own and Edison's interests at heart, not merely for my own proposed connection, but because I know as well as any other man the value and extent of Edison's work, and also because of our own personal friendship.

The Swan Company is pushing forward, and in this connection let me say that Edison must not abate the work on the lamp, Swan is making continual advance, and has recently commenced making lamps by a new process, which are the finest lamps I ever saw. They are not yet public, but Crompton, who is now one of the Swan Directors showed me one, and he says I will be able to get some soon; I will bring over one or two, if ever I get them. This new lamp is claimed to have 100 ohm resistance hot, and it can easily be increased, and to require but .6 of an ampere, and 36 volt-amperes, for 20 candle power. I think perhaps this is a little high, but it is a wonderfully fine lamp, and I think can be made more cheaply than Edison's, and has fully as much life. He is making other lamps of 40 candle and has recently made lamps

of 300 ordinary candle power. My position here has given me splendid opportunities to know the weak and strong points about the lamps of different makers, and I wish with all my heart that I was in a lamp factory for three months.

Crompton informed me privately that the Company were turning out 15,000 lamps a week, and I am inclined to believe him.

My work is keeping me here longer than I expected. Some of the experiments after all are hard work, are worthless, among others that of the 250 lights, and I shall not allow such ones to become public.

I have not heard from Mrs. J. but trust you are all well. With love to all, and in hopes of an early reply,

Your sincere friend,

F. J. Sprague.

Recd.

The Edison Electric Light Company, Limited,

Telephone No. 348.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

74, Coleman Street,

London, E.C., 22nd Sept. 1882.

T. A. Edison, Esq:
65. Fifth Avenue,
New York. U.S.A.

Dear Sir,

I beg leave to forward you herewith Copy of Dr. Hopkinson's Report on Provisional Orders.

May I ask you to be good enough to read it and to favour the Directors with your own views on the subject.

I am, Dear Sir,
Yours truly,
Arnold White
Secretary
pro H.W.P.

[ENCLOSURE]

Report
from Dr. Hopkinson
as to Provisional Orders
dated Sept. 9th 1882.

4 Westminster Chambers
Victoria Street - Westminster
London S.W.

(2) Provisional Orders. The rules laid down by the Board of Trade with respect to licenses and Provisional Orders require amongst other things that the Applicants shall make certain statements as to the conditions under which they propose to supply electricity. It is desirable that we should begin to consider what conditions we would wish to propose and what we should be prepared to accept. Although it is probable that further knowledge may alter even my own views it may not be altogether useless to note down conditions which appear most appropriate to day. They may serve as a basis for discussion.—

The Board of Trade will almost certainly require a superior limit of price to be fixed. As we shall be compelled to supply all Consumers on equal terms, as it will in general be much more costly to supply a consumer who uses a large current of electricity for a short time than a consumer who uses a smaller quantity for a longer time it is essential that we should be empowered to divide the charge to the consumer into two parts, one part being a fixed rental proportional to the maximum current he is able to draw from the mains — and based upon the dead expense involved in providing machinery and other plant to meet

much possible demand, a second charge proportional to the quantity of electricity actually used by the consumer as registered by a Meter approved by the Board of Trade and based upon the current expense in coal, wages and oil involved in producing that electricity. Each consumer should be required to declare before hand the maximum current he would wish to draw. The branch conductor to his premises should be provided with a fusible plug which would break down and cut off his supply if that maximum were materially exceeded also with a Meter capable of measuring up to the breaking point of the plug: He should be entitled to charge a maximum rental proportional to the potential supplied and a maximum price per unit of electricity actually used. This principle once accepted the figures themselves will require very careful consideration and will no doubt be to a certain extent a matter of bargain between the Board of Trade, the consenting Local Authority and the Undertaker. As the lighting of the streets is a branch of supply very regular in its character and of considerable duration it might be prudent to conciliate the Local Authorities by omitting in that case the fixed rental charge for dead expenses. It might also be appropriate to obtain authority to omit this charge in the cases of consumers who limited their consumption to hours when the general demand was small for example the supply of electricity used for motive power during the hours of daylight.

He should be required to declare what

[ENCLOSURE]

we will contract to supply to the public. We must undertake to maintain between the two conductors conveying electricity to each Consumer a difference of potential constant between certain limits say never less than 103 Volts, never more than 110. We should undertake to do this at all hours of the day and night with the exception of certain short specified times reserved for the purpose of testing the Mains. The order will no doubt require us to supply any Consumer who may wish it within a specified distance from our main conductors but I think we should be protected by the requirements of an ample notice from such Consumer and an undertaking that he will continue to use the electricity for a reasonable time. –

As the prime cost of our Machinery is probably higher than that of our competitors but we are able to do the work in a more efficient way than any one else our policy should be to press for a limit of price which should allow us an ample margin of profit allowing for all contingencies, on the other hand we should offer the most stringent guarantees of efficiency. —

(Signed) J. Kopkinson

(No. 26)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

Shandon Hydropathic Establishment
Gareloch
Septr. 25th 1882.

The Secretary,
Edison Electric Light Co. Ld.

Dear Sir,

In reply to your favour of 18th inst I beg to say I submitted your estimate to the Committee of Visitors for County Asylum but the price seemed to astonish them and nothing definite has yet been done in consequence.

If anything can be done for public Buildings or Works at a lower rate I will be glad to be apprised of it.

I am, Dear Sir,
Yours Resply
(Signed) N. Tice.

LEWIS ULRICK & Co
ENGINEERS,
LICENSED MANUFACTURERS OF THE
"FIELD" PATENT BOILERS AND TUBES,
SOLE LICENSEES
FOR HERRMANN'S PATENT MALT KILN FLOORS.

27, Leadenhall Street,
London, E.C. Sept. 25 1882

T. A. Edison Esq
Menlo Park
N.J. U.S.A

My dear Sir

I have for some time past intended writing you, partly to thank you for the courtesy you shewed me during my visit to N.Y. & partly to give you some account of the condition of things in England.

A letter Arnold White read to me this morning however determined me to delay no longer in sending you a line & to perhaps correct a misapprehension, if any exists, as to what I am ~~and~~ credited with in your letter to him.

I would send you a copy of my report concerning my electrical enquiries, if I did not know you are averse to anything approaching "Taffy" (?) but you would not

find one word in it other than of sincere admiration for the great labour you have bestowed on your system, and the perfection of the results. I don't know what White wrote you, but presume it must have been something relating to a general conversation as to probable success in England as against the States. I believe he asked me if I thought there would be as much difficulty to get people to take the light in England as there had been in the States. – I told him naturally I considered there would be much greater difficulty, from the fact that the average price of gas here is but 70c, and also that our factory act limits the hours of labor & consequently the time necessary for artificial light. You will certainly agree with me that no one could take exception to such an expression of opinion, and he would be a first class lunatic who would shut his eyes to this fact.

LEWIS OLRICK & Co.
ENGINEERS.
LICENSED MANUFACTURERS OF THE
"FIELD" PATENT BOILERS AND TUBES.
SOLE LICENSEES
FOR HERRMANN'S PATENT MALT KILN FLOORS.

27, Leadenhall Street,
London, E.C. 188

In regard to the price of the machines, I was glad to be able to set him right on that score, telling him of my certain knowledge that you were making rather a loss than a profit by making & supplying them.

I want you clearly to understand that I am one of your firmest adherents, and back your system and knowledge against anyone in the field; — at the same time I am alive to the fact that it requires considerable work and perseverance to make a financial success, even of your light.

In Lancashire the Company have offered to install on the basis of rental, and at a price which would not give them 5% for their money, leaving out of consideration the chance of accident, & yet (you will scarcely believe it) they find it impossible

at present to get any "takers". They have taken to heart your recommendation conveyed thro' me, to put down central stations, & went to the extent of procuring a ~~[illegible]~~ lot & ordering engines and boilers, but now they are stopped by the municipality who are competitors in the supply of gas & or light, and who intend applying under the act for permission to lay mains &c. This really means a full stop for at least 6 months.

From this you can readily see that it is not smooth sailing, and will sympathize with their impatience (I mean the directors)

You will be glad to learn however, that at the statutary meeting of shareholders of the Lancashire Co, perfect confidence was expressed in the future of the light and everyone seemed content to await results.

With kindest regards to Mrs. Edison & hoping you will command me if I can in any way serve you I remain Yours faithfully

Harry Oliver.

New York, September 26th. 1882.

65 Fifth Avenue.

To the Secretary of the Edison Electric Light Co. Limited.

74 Coleman Street

London, E. C.

England.

Dear Sir:-

I duly received your favors of the 5th. inst., enclosing a copy of letter to Mr Johnson, also yours of the 9th. inst. With reference to the L armatures, I must entirely dispute your assertion that they were not ordered. Your original order was for 25 spare bar armatures. After this order was given you were notified that it was commercially impracticable to make bar armature machines at the present time in consequence of the heavy cost of the special tools requisite for the work and that I had decided to make the smaller machines up to 250 lights with wire wound armatures. I received your cable assent to this alteration. You also ordered 100 one hundred light dynamos. At the time your order was given I had never built a 100 light dynamo and in experimenting on the model machine I found that it would be cheaper for my customers if I made it a 150 light machine. I did this after consulting with the officials of my American companies who informed me that a 150 light machine would be fully as useful if not more so to them in their business. Had I made a 100 light machine it would have cost you considerably more than $6 per light. In quoting the pro-

bable price of 100 light machine I stated that I thought it would be about $6 a light but my experiments on my model machine proved that it would have cost considerably more and as your order to me was on the basis that I should supply the machinery to you at as low a cost as I possibly could, it would have been quite open to me to have charged you more for 100 light machine. I preferred, however, (and by accepting the 150 light machines you endorsed my preference), to build 150 light machines which I found I was able to do at a cost to you of $6 per light F. O. B. New York. I consider I was fully justified in sending you the extra L armatures and I do not at all agree with you when you state that they were sent you and drawn for entirely outside your orders and furthermore I would say that they were sent upon my personal order and with my knowledge and that the "officials entrusted with the execution of the Company's orders" simply carried out my directions in sending them. In refusing to honor my draft, I consider that you acted in a manner not at all justifiable and in afterwards reconsidering the course you had taken and accepting the same you simply extricated yourself from a position which, had you pursued the proper course, you ought never to have occupied. As to the extra 3 K armatures referred to in your favor of the 9th., I would point out to you that you accepted my bill for these without even pointing out to me that you considered that the goods were not ordered; that it was not until long after the armatures had been in your store that you raised any point whatever as to them. My remarks as to the extra L armatures equally

applies to these and I must respectfully decline to give you credit for them inasmuch as I consider I hold your order for them and that you did not object to accept them at the time they were sent you. As to the 100 ten candle power lamps charged to you at $2, I explained to you in my last letter at considerable length my reason for charging $2 for these. Even if there were any contract price for 10 candle power lamps those lamps would not come under the provision of that contract as they were ordered by Mr. Johnson long before your company was formed. With reference to the 300 ten candle power lamps charged you at 75 cents, I beg to state that these lamps in no wise come under the terms of my contract with you; that the price charged is as low as I can make it considering that we have only just commenced turning out the lamps. I am, therefore, compelled to refuse to credit you with the sum of $225 so called overcharge on lamps. With reference to the sockets which you state Messrs Bergmann & Co. have sent you in excess of what you ordered, I would draw your attention to the fact that the extract from your letter of the 11th. August does not all agree with your order to me dated the 30th. of May. In this order you ask for a "sufficient stock" of polished brass sockets with cocks." In your letter of the 11th. you state that no polished brass sockets were ordered. Under your letter of the 30th. of May, I had instructed Messrs Bergmann & Co. to send you 12,500 polished brass sockets with cocks as that was the amount that I estimated should go with such an order as you had given me for dynamos and lamps after deducting

the sockets of other forms ordered by you. I, therefore, hold that the position you have taken with reference to the sockets is an entirely erroneous one, and that Messrs Bergmann & Co. have not sent you as many sockets as were ordered from them by about 9000. If you had desired that no sockets whatever should be sent you you ought to have left the space which is now occupied by "sufficient stock" in my order from you, blank. You cannot construe these words as meaning that you had sufficient stock on hand or else every other item on the order must be construed in the same manner. At the time your order came to hand I read it at once as meaning that you left to me the ordering of the sockets and the decision of the exact number that should be sent you. I had no wish whatever to have put on me the responsibility of such a decision as is proved by the fact that I refused the first order you sent me sometime prior to may 30th. and insisted that your Company should supply me with the details of what you wanted. I am sorry, therefore, not to be able to comply with your request to credit you with $9,825,48. As to the L armatures, I have already given you credit for them notwithstanding that I consider that I hold your order for their shipment. I did this for the same reason that I stopped shipping dynamos to you, namely, to relieve you of stock which you could not dispose of. I am prepared to relieve you of some of the sockets as I receive orders from my other companies for the same; not because I consider you justified in the demands you make for a credit on account of them but simply from a desire to help you out as much

as possible. I have accordingly cabled you to ship 1000 polished brass key sockets to Hamburg, 1000 to Antwerp and 1000 to Genoa, credit for which will given you in due course. As to your remarks to the effect that the drawing facilities that I have hitherto enjoyed can be revived on my giving you a receipt for $9,825,48, I beg to state that I have no wish whatever that the former mode of payment to me should be resumed and I desire that you make the necessary arrangements to have my bills paid and accepted here in New York on shipment of the goods. I am compelled to take this course as I consider the spirit displayed in your later correspondence to be far from friendly or such as I should like to have exist between myself and my customers. I would much prefer that for the future you will order your apparatus from other sources as I have no time or inclination to continue a correspondence of the character recently developed in letters from you.

At the time your order was given, it was intimated to me that it was very doubtful whether I could supply the machinery as quickly as you would desire it; that the necessity of its prompt delivery in London was of the very greatest importance and in order to meet your wishes in the matter I put myself to great inconvenience in order to put your order through quickly. In a letter to Mr Johnson you state that you do not consider that I am meeting you at all in your desire that the shipment should be stopped. I may say that I stopped short of shipment of dynamos to the amount of about $30,000 at a time when I could ill afford

to do so. Messrs Bergmann & Co. have stopped short of shipments to the amount of about 4 or $5,000. Immediately your cables came requesting that shipments be stopped the instructions to that effect were given out and I did all in my power to save you expense not for one moment considering ~~that I had a~~ my legal claim on you for orders given. I do not think that the course I pursued has been at all reciprocated by you, and if you carefully read over your letters recently addressed to myself and Mr Johnson you cannot but come to the same conclusion. With reference to your order for lamps of small candle power, I would state that I am not making them and that I do not feel inclined to go to the expense and pursue the necessary experiments to produce a lamp such as you ask for in view of the spirit your correspondence to me displays.

Signed by T A Edison Sept 26.82

3

Sept 26. 82

from WATERHOUSE & WINTERBOTHAM,
Solicitors.

1, NEW COURT,
CAREY STREET,
LINCOLNS INN, W.C.

Waterhouse & Johnson

Sept. 28. 1882

Dear Mr. Johnson,

Your letter of the 11th reached me by the hand of Mr. Newton yesterday, & I hasten to assure you of the regret with which I read of the matters of which you write, & of my own concurrence in much of what you say as to what might be a policy here. I believe nothing would do so much for us, & nothing can seriously

take the place of, a few efficient subalterns. My hope is that these may speedily be set in port, whether or no this can be done on terms immediately remunerative. But it is clear that for the present at least, owing to several causes, the formation of subsidiary companies is in abeyance, & that the parent company must be reorganized. I was glad to hear by your previous letter that Mr. Frobisher was shortly coming over, & trust that when he comes he may be able to devise the right thing in this respect. At present our prospects are not what we hoped they would have been, but I cannot myself see that the discouragement which some of our friends feel is due to causes which may not be overcome.

Crewdson has told me much about his visit to New York, where he saw much which greatly interested him. I should be glad to have further particulars of your central lighting station as soon as there is time to report.

I am trying to see whether we cannot do some work at the Gresham station. The best is London for the Edison light, since the rent is low, & there is convenient lift & shelfboard for the

arc light they brought round.
I shall be happy to write to you
again as soon as I have
seen Mr. John Lutbrich, who
is at present abroad, but
expected back shortly. When
shall we see Mr. Bettis? I
was told in Des Moines
that they understood there he
was to sail on the 27th (tomorrow).

Believe me
yours very truly
Mabel Waterbury

Edw. H. Thomas Esq.
56 West 12th Street
New York

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 26TH SEPTEMBER, 188

T.A. EDISON ESQ.,
MENLO PARK,
NEW JERSEY,
U.S.A.

DEAR SIR,

ENCLOSED I BEG TO HAND YOU EXTRACT FROM THE "TIMES" OF 23RD INSTANT RELATIVE TO A NEW DYNAMO SAID TO HAVE BEEN INVENTED BY SIR WM. THOMSON AND MR. FERRANTI.

I AM, DEAR SIR,

YOURS TRULY,

A. Macpherson
for SECRETARY.

ENCLOSURE.

[ENCLOSURE]

Telephone No. 346.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 188

TIMES. - SEPTEMBER 23RD, 1882.

IT HAS BEEN EVIDENT FROM THE FIRST INTRODUCTION OF THE ELECTRIC LIGHT BY THE ARC AND INCANDESCENT SYSTEMS THAT INVENTORS WOULD BUSY THEMSELVES TO DISCOVER SOME MEANS OF PRODUCING THE CURRENT AT LESS EXPENSE. WHEN THE ELECTRIC LIGHT COMPANIES WERE BEING SO RAPIDLY FORM--ED AND SUPPORTED BY PUBLIC SUBSCRIPTIONS SOME TIME BACK, WE WARNED ES--PECIALLY THE BUYERS OF THE SHARES AT HIGH PRICES OF THE RISK THEY RAN OF HAVING THE GROUND CUT FROM UNDER THEM BY A NEW DISCOVERY. ELECTRI--CAL SCIENTISTS HAVE BEEN DILIGENTLY AT WORK TRYING TO IMPROVE UPON THE BULKY AND EXPENSIVE DYNAMO MACHINES NOW IN USE, AND WE UNDERSTAND THAT SIR WILLIAM THOMSON PATENTED A NEW INVENTION FOR A SIMPLER AND MORE EF--FICIENT DYNAMO MACHINE ONLY A SHORT TIME BEFORE AN ELECTRICIAN IN --- MESSRS SIEMENS' ESTABLISHMENT HIT UPON MUCH THE SAME THING. THE GREAT FEATURE IN THE NEW MACHINE IS THE ABSENCE OF IRON IN THE REVOLVING ARMA--TURE, VERY GREATLY DECREASING ITS WEIGHT, AND, BY ENABLING THE FIELD MAG--NETS TO BE BROUGHT VERY CLOSE TOGETHER, GREATLY INCREASING ITS EFFICIEN--CY. IN FACT, IT IS STATED THAT A FERRANTI MACHINE TO PRODUCE 10,000 INCANDESCENT LIGHTS, OR AN EQUIVALENT NUMBER OF ARC LIGHTS, CAN BE MAN--FACTURED FOR LESS THAN ONE-FIFTH OF THE COST OF THE CHEAPEST DYNAMOS AT PRESENT BEFORE THE PUBLIC. THE INCREASED EFFICIENCY OF THE NEW MACHINE IS AIDED BY THE ABOLITION OF THE COMMUTATOR. THE ANNOUNCEMENT OF THIS NEW MACHINE HAS BEEN, WE ARE INFORMED, GREETED WITH INCREDULITY, AND NATU--RALLY SOME PERTUBATION HAS BEEN CAUSED AMONG THOSE INTERESTED IN EXIST--ING DYNAMO MACHINES LEADING TO LETTERS HAVING BEEN ADDRESSED TO US RAIS--ING POINTS IN REFERENCE TO ENGAGEMENTS ENTERED INTO WITH SUBSIDIARY COM--PANIES. BEFORE PUBLISHING THE NUMEROUS LETTERS REFERRED TO, WE THOUGHT

[ENCLOSURE]

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 188

IT BETTER TO MAKE ENQUIRIES, AND THE RESULT IN THE CASE OF THE HAMMOND COMPANY IS THE FOLLOWING LETTER WHICH, AS REGARDS THE ENGAGEMENTS OF THAT COMPANY TO THE SUBSIDIARY COMPANIES WILL, IT IS HOPED, BE SATISFAC--TORY:-

"THE HAMMOND ELECTRIC LIGHT & POWER
SUPPLY COMPANY, LIMITED,
110, CANNON STREET. E.C.
21ST SEPTEMBER, 1882.

"SIR,

IN ORDER TO CORRECT CERTAIN MISAPPREHENSIONS WHICH SEEM TO EXIST IN REFERENCE TO OUR COMPANY, I BEG TO ADVISE YOU THAT WE WERE NOT CONSTITUTED TO WORK THE BRUSH SYSTEM SOLELY, THOUGH WE ACQUIRED THE BRUSH RIGHTS OVER CARTAIN COUNTIES. IN ORDER TO EXTEND OUR FIELD OVER THE WHOLE OF GREAT BRITAIN, WE HAVE NOW ACQUIRED THE SOLE AGENCY OF THE FERRANTI MACHINE FOR THE DISTRICTS NOT COVERED BY OUR BRUSH CONCESSIONS WHICH WE STILL HOLD.

"IN REFERENCE TO THOSE SUB-COMPANIES WHICH WE HAVE FOUND--ED OUR DIRECTORS DESIRE TO GIVE THEM THE FULL BENEFIT OF THE NEW INVEN--TION, AND WILL OFFER THEM THE USE OF THE NEW DYNAMO WITHOUT DEMANDING ANY FURTHER PAYMENTS FOR A LICENCE BEYOND THAT WHICH THEY HAVE ALREADY PAID TO OUR COMPANY, THE DESIRE OF THE BOARD OF THIS COMPANY BEING THAT ALL THEIR OFFSHOOTS SHOULD PARTICIPATE FULLY FROM TIME TO TIME IN THE SUCCESSES OF THE PARENT COMPANY.

"YOURS FAITHFULLY,

"ROBERT HAMMOND.

MANAGING DIRECTOR.

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., Sept. 28th 1882

My dear Johnson

The Company have received a communication from Mr Edison, dated 12th Sept. which is being answered in the same way as it was addressed – officially. This letter partially refers, however, to my letters to you, & I therefore wish to point out how impossible it will be for me to continue the confidential intercourse on Company matters I have had with you, if my letters are to be answered in an official manner, by another hand than your own. Our difficulties here are very serious indeed, as Mr Fabbri will see for himself next week, & I think that you might have found some other way of communicating with me than the course above mentioned.

There are many things upon which I was going to write you, but I really am so pressed today I have no time.

Yours very truly

Amos A. Mute

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C. 28th September 1882.

T. A. Edison Esqre
Menlo Park.
New Jersey
U. S. A.

Dear Sir,

The Board of Directors have received and carefully considered the contents of your Letter of the 12th of September. —

With reference to the Statement that you in "no wise fell into the error of estimating the net "cost of a Plant to the Company, not even in London "but in New York in the case of the Edison Company "with the gross price including profit charged by the "Swan Company", you will on referring to Page 2 of your Letter of the 11th of August find the following. "As compared with Swan Estimate with Burgon "Machine my Estimate of ~~cost~~ cost is £2.5.9 above "what Swan will supply the Plant for". —

Your original Estimate of Cost Cost of 80 Light is also enclosed herewith, containing the comparison to which reference was then made, and which, together with the paragraph quoted above, appears to

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THE SECRETARY.

The Edison Electric Light Company, Limited,

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the Board to place the matter beyond further dispute.

As you deduct the cost of Swan Gross from that of Edison net and remark that the excess of Edison over Swan is £2.5.9, it is difficult to see how the statement of which you complain can be gainsaid. –

As to the net cost of an 80 Light Installation the Directors observe;

First. That you have omitted to take into consideration the Siemens Royalty of 6 per cent, which is £9 on a selling value of say £150. –

Secondly – That you have charged the Sockets at 20 cents, when in point of fact we have a large Stock that must be worked off for which Messrs. Bergmann have charged and been paid $1.6 – and

Thirdly – That the amount of £2.16.8 mentioned by you to cover freight and Insurance is quite – insufficient. From our Books we find that the charges for Freight, Insurance, landing, Warehousing and painting (which are all necessary operations before the Machine is ready for delivery to customers) are £11.9.2 which brings the Nett cost of a 'Z' Dynamo in London to over £135.10.0. –

These facts are indisputable and as they are of

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The Edison Electric Light Company, Limited,

74, Coleman Street,

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serious import to the well being of the Company, the Board lay claim to your good offices and assistance in coping with the difficulties which they present. —

In addition to this, Swan's Estimate includes such labor as is necessary for erecting the Plant in the Customer's premises, rendering the comparison instituted by you still more unfavorable to ourselves. —

With reference to the Statement that you have had to meet with the same competition in America as that encountered here, the Directors wish to point out,

First. That the average price of Gas in England is about One third of the rate prevailing in America. —

Secondly. That the Municipal Institutions of the Towns and Cities of Great Britain are more difficult of access than is the case in the United States, where such Bodies, being in some cases more enlightened, and in others more open to influence from without, are accessible to conviction. You may contrast the arrangements which the Parent Company in America has been able to make readily in New York for taking up the Streets with the difficulties which are, for example, now being encountered by the Directors of the Manchester Company, where the Corporation of that City will neither themselves stir in

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The Edison Electric Light Company, Limited,

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the matter of Electric Lighting, nor allow any one else to do so. —

Thirdly. A rivalry of 52 Electric Light Companies with a capital of £18,000,000, many of which are powerful and energetic Bodies, comprising thousands of shareholders, in existence before the Syndicate now working your Patents was formed six Months ago, is not represented by any like competition in America. —

If these facts be so, it is difficult for the Board to understand without further information from you on the subject, in what respect you have had to meet with the same competition as the Edison Company contend against here, or in what way you would have overcome it. Any information you are good enough to afford in these matters will be of material value to the Company in their operations and they will be very glad to receive it. —

Instances of the replies to Ninety nine per cent of the Company's Tenders and Estimates are enclosed. The Manchester Company meet with similar experience. —

<u>Lamps.</u> With reference to your Paragraph about Lamps, the remarks made by you generally accord with the views of my Board on the subject. They do not expect to be supplied with Lamps of exceptional power, or other

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

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special characteristics involving extra expense, under Clause 16 of the Agreement of the 18th of February; but the 10 Candle Lamps sent forward for which £2 were charged were unaccompanied at the time with any such explanation as that which you now offer which would show that the Lamps were novel in construction or costly in production. Neither have the Company any desire to restrict the efforts you may make towards the improvement of your System; on the contrary they have every desire to see every effort made in the direction of economy and efficiency; but it is in all cases important before improved Lamps or Machinery are sent in quantity to us, that the Board should be consulted and the price agreed on. It was partly with this object that Mr. Johnson was appointed to act for the Company in New York. We are naturally glad to have any new pattern of Lamps sent. In future we shall wish to receive at first only a few samples of any novel form of Lamp or other Speciality you may devise that we may determine whether the new article is likely to be in demand for our purposes. Should such be the case we can then table you for such supply as we deem adequate. So large a quantity as 100 is more than we require for the purposes of experiment by our Scientific advisers or otherwise. —

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The Edison Electric Light Company, Limited,

74, Coleman Street,

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"L" Armatures and Sockets over supplied. Your remarks on this subject have received the special attention of the Board, and the Directors regret that the friendly consideration which they evinced in consenting reluctantly, to meet the draft for Goods which were not ordered by them has been followed by a communication of the nature of your Letter under reply. So long as you complied with the Company's stipulations they met your drafts promptly, as agreed, but if your Assistants on their own responsibility send without authority such Articles as Sockets in large quantites at a high price or spare Armatures for seventy three Machines the greater part of which are in our Warehouse you can hardly be surprised if the Board object to recognize Drafts to pay for them. —

Should you be desirous of shipping such Goods to us the Board think the reasonable course to pursue would be to enquire by Cablegram or Letter if they might be sent on. —

As to the powers of drawing confided to you were of unusual liberality especially in the case of the C. Dynamos for which thousands of Pounds have been paid Months in Advance of their delivery the

Telephone No. 346.

ALL LETTERS
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The Edison Electric Light Company, Limited,

74, Coleman Street,

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Board are of opinion that they were entitled to have scrupulous regard paid by your Assistants to the obligation of not abusing them. —

I am Dear Sir
Yours truly
Imo a White
Secretary

27.

I have the honor to avail myself of an favorable opportunity to address you

SWAN'S ELECTRIC LIGHT COMPANY, LIMITED,

13, MOSLEY STREET, NEWCASTLE-ON-TYNE,

TRADE MARK.

COMMUNICATIONS TO BE ADDRESSED TO THE SECRETARY.

Edison Esqre
Menlo Park
New Jersey, U.S.A.

29th Septr 1882

Dear Sir,

I venture to address you under the following circumstances.

At the formation of the above Company I was selected as Secretary from about 200 Candidates & am now acting in that capacity, but the business of the Company having been transferred to the Swan United Electric Light Co Ld, another gentleman has been appointed to my position, & my services will not be required much longer.

Under these circumstances

tas I was the first to suggest an improved form of lamp, (almost identical with the form now used) as well as many of the fittings which have been sold by the Swan Co, I feel that I have been very badly used, & have given some special attention to the designing of another form of lamp & holder which shall be, if possible, superior to the present Swan lamp; which I should have much pleasure suggesting to you, for our mutual benefit, & which I feel sure would be of much greater value to you & your English Company, than any amalgamation with the Swan Co which is now talked of in London. —

If therefore you would like to enter into some arrangement with me, I shall be happy to place myself at your disposal, on something like the following terms.

1st That I give you my best services, in any capacity you may desire, including the manufacture of lamps & the giving of my ideas as to the improvement of same, secretarial duties, & the looking after Electric Lighting installations, &

2nd That you engage me for not less than 6 months, at ~~[illegible]~~ but less than £25 per month & pay my 1st class passage to and from America, & give me say 1/4th share of net profit obtained by any improvement I may suggest & which you adopt.

As I have not obtained any protection at present I cannot of course give you particulars of my ideas, but if you now agree to some such arrangement as that which I propose, I am very confident you will have no cause to regret it, & if you will send me a Cable message upon receipt of this addressed "Cox, Gosforth, Newcastle" approving, I will at once make arrangements to come over, & I shall be glad to receive a letter from you by return mail, addressed as under.

I am Dear Sir
Yours faithfully
William J. Cox

22 Lansdowne Terrace
Gosforth
Newcastle on Tyne

P.S.
Of course I rely upon your keeping this communication strictly private, if you do not approve of my suggestion.
W J Cox

(No. 26)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

4, WESTMINSTER CHAMBERS,
VICTORIA STREET, S.W.

SEPTEMBER, 30TH. 1882.

TO THE DIRECTORS OF THE EDISON ELECTRIC LIGHT CO. LD.

GENTLEMEN,

THE EDISON DYNAMO ELECTRIC MACHINES ARE DESIGNED WITH A VIEW TO THE GREATEST ECONOMY OF POWER. WE SHALL PROBABLY FIND EVEN WHEN WE REALISE THE FULL ADVANTAGE OF A SYSTEM OF COMPETITIVE TEN--DERS THAT THEY ARE COSTLY IN PROPORTION TO THEIR OUTPUT. IN MANY CASES PRIME COST IS OF MORE IM--PORTANCE THAN ECONOMY OF COAL. CASES ALSO OCCUR IN WHICH IT IS DESIRABLE TO VARY THE CONDITIONS UNDER WHICH THE MACHINE WORKS, FOR EXAMPLE THE SPEED OF ROTATION. IT IS THEREFORE NECESSARY TO MAKE A CRITICAL STUDY OF THE MACHINES WITH A VIEW NOT ALONE OF IMPROVING THEM BUT OF PLACING OURSELVES IN A POSITION OF BEING ABLE TO SAY BEFOREHAND HOW WE SHOULD MODIFY A MACHINE TO MEET VARYING CONDITIONS. THIS I HOPE TO DO AS SOON AS I AM IN POSSESSION OF SOME OF THE DETAIL DRAWINGS OF THE MACHINES; IN THE MEANTIME WE ARE ABOUT TO PROCEED WITH THE NECES--SARY EXPERIMENTS WITH THE Z DYNAMO. A CASE IN POINT IS THE LIGHTING OF THE STEAMSHIP NOW BEING CONSTRUCTED IN GLASGOW BY MESSRS. DENNY. HERE IT WAS PROPOSED TO USE AN L DYNAMO RUNNING AT 900 REVOLUTIONS DRIVEN BY A STRAP TO SUPPLY ELECTRICITY FOR 140 OR 150 A LAMPS.

(No. 26)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

DR. FLEMING FINDS THAT OUR PROPOSED CUS--TOMERS WILL HAVE NOTHING TO SAY TO STRAPS BUT IN--SIST ON DIRECT DRIVING AND THE QUESTION IS WHAT ARE WE TO DO WITH AN L DYNAMO TO CAUSE IT TO GIVE A SUFFICIENT ELECTRO-MOTIVE FORCE WHEN RUNNING AT 600 OR 700 REVOLUTIONS? TO ANSWER THIS QUESTION I THIS MORNING TRIED WITH DR. FLEMING A Z DYNAMO HAVING AN A ARMATURE BUT HAVING THE MAGNETS COUPLED IN PARALLEL CIRCUIT AS IS CUSTOMARY WHEN A B ARMATURE IS USED; WE FOUND THAT WE COULD EFFICIENTLY RENDER THE LAMPS INCANDESCENT WITH THE MACHINE RUNNING AT FROM 800 TO 900 REVOLUTIONS INSTEAD OF 1200 IF THE MAGNETS WERE IN SERIES; THIS IS VERY MUCH WHAT I EXPECTED TO FIND. THE EXPERIMENT SHOWS US THAT BY SIMPLY ALTERING THE COUPLING OF THE MAGNETS OF AN L DYNAMO WE CAN ACCOMPLISH WHAT WE DESIRE, BUT WE SHALL DO SO BY A WASTE OF POWER IN MAGNETIZING IN--STEAD OF REQUIRING 1.1 H.P. TO RETAIN THE MAGNETS WE SHOULD REQUIRE 4.4, THIS IS TOO EXTRAVAGANT AND WE SHALL REDUCE IT TO ABOUT 2.2 BY LEAVING THE COUPLING OF THE PRESENT COILS AS IT IS AND WINDING ADDITIONAL COILS OUTSIDE OF THEM. I AM NOT WITH--OUT HOPES THAT WE MAY SUCCEED IN LARGELY INCREASING THE OUTPUT OF THE MACHINES BY OTHER ALTERATIONS OF THE MAGNETS, BUT I CANNOT SPEAK DECIDEDLY UPON THIS UNTIL THE EXPERIMENTS I MENTIONED ARE MADE AND THE DETAILED DRAWINGS BEFORE ME.

I AM, GENTLEMEN,
YOURS RESPECTFULLY,
SIGNED: J. HOPKINSON.

EJM

Recd Oct 8/82

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Telephone No. 148.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

The Edison Electric Light Company, Limited.
E.E.L. & S.C.
74, Coleman Street,
London, E.C., 2nd Oct. 1882.

Samuel Insull, Esq.
65. Fifth Avenue.
New York.

Dear Sir,

One of the enclosures sent in the letter to Mr. Edison dated 28th September, was his original estimate, showing a comparison with Swan. You may further recognise it by the words "nett" & "gross" in Red ink on the face of it.

No copy of this was taken before it was returned to you. May I ask you as a personal favour to let me have the original back again at your earliest convenience.

I am, Dear Sir,
Yours truly,
H. S. Theobald.

SOCIÉTÉ INDUSTRIELLE ET COMMERCIALE EDISON

Société Anonyme, Capital : 1.500.000 Francs

EXPOSITION INTERNATIONALE D'ELECTRICITÉ

Grand Diplôme d'honneur

PARIS 1881

Ivry-sur-Seine, le

Oct 3 1882

Mr A Edison

Menlo Park

My dear Edison,

I acknowledge your cable of today: "Don't tell London company anything about lamp manufacture"

Yours "Batch"

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 7TH OCTOBER, 1882

RECEIVED
OCT 21 1882
ANSWERED

.....188

THOMAS A. EDISON ESQ., FILE No
MENLO PARK,
NEW JERSEY,
U. S. A.

DEAR SIR,

REFERRING TO THE ENCLOSED COPY OF A LETTER FROM MR. BATCHELOR, WILL YOU BE GOOD ENOUGH TO SAY WHETHER YOU ENTERTAIN ANY OBJECTIONS TO PARTICULARS RELATIVE TO THE MANUFACTURE OF LAMPS BEING FURNISHED BY MR. BATCHELOR TO THIS COMPANY ?

ENCLOSED I BEG TO HAND YOU COPY OF DR. HOPKINSON'S REPORT ON DYNAMOS.

I AM, DEAR SIR,

YOURS TRULY,

Thos a White

SECRETARY

ENCLOSURES

[ENCLOSURE]

(No. 26)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

SOCIETE INDUSTRIELLE ET COMMERCIALE EDISON
IVRY SUR, SEINE.
3RD OCTOBER, 1882.

ARNOLD WHITE ESQ.,
THE EDISON ELECTRIC LIGHT COMPANY,
LONDON.

MY DEAR WHITE,

IN ANSWER TO YOUR LETTER OF SEPT. 25TH I MUST SAY THAT IT IS VERY MUCH AGAINST OUR RULES TO DO WHAT YOU WANT; BUT IF YOU WILL GET THE CONSENT OF EDISON I WILL GIVE YOU ALL DRAWINGS, INFORMATION, MODELS ETC. ETC. ETC. - OF COURSE AT YOUR EXPENSE.- THAT YOU MAY REQUIRE FOR THE MANUFACTURE OF LAMPS.

VERY RESPECTFULLY, YOURS

SIGNED: CHAS. BATCHELOR.

4 Oct 16

Arrived 8th Oct

Brewood

10 Oct

Payton

16

Dear Sir

What answer have you about the telegram from Vogel

A word would oblige

Yours

Payton

E H Johnson Esq

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THE WINDSOR HOTEL
FIFTH AVENUE, NEW YORK
HAWK & WETHERBEE.

Oct 14. 1882.

My dear Sir

Myself and friend availed ourselves of your order for your Central Park last evening, and I drop you a line in acknowledgt of your courtesy herein, as well as for the interview and talk we had together.

Apropos of the price of Gas in the City of Manchester, I send you enclosed a slip from "The Manchester Guardian", wh I only recd this morning in wh you will read the latest news about gas rates.

On Monday morning I will take the liberty of looking in upon you again, when I may perhaps be fortunate enough to meet Mrs Johnson.

If I can be of any service to you on

29

Oct. 14. 82

Ellis

the other side - my large and long interests in Gas lighting so far from being antagonistic to the new-agent may rather prove auxiliary. At all events I can see no reason to the contrary.

Your obedt Servt.

Ellis Shaw

Thos. A. Edison Esq.
110 5th Avenue
City

[ENCLOSURE]

MANCHESTER CORPORATION GASWORKS.

PROFITS OF THE YEAR.

The Gas Committee of the Manchester Corporation will present their annual report to the City Council at the monthly meeting of the latter body on Wednesday next. The Committee propose to pay over £52,000 to the Improvement Committee, but they state that in order to make up this amount it will be necessary to withdraw a sum of £8,530. 8s. 10d. from the reserve fund. The Committee add:—"This deficiency is largely due to the decreased revenue resulting from the last reduction in the price of gas, in conjunction with the fact that no equivalent increase in the consumption of gas has taken place, the increase recorded being 1·85 per cent only, against 4·38 per cent last year. The smaller ratio of increase in the consumption of gas does not, however, represent the full extent of the effects upon the Committee's business of the past mild winter, the influence of which is also to be traced in the lessened amount realised by the sale of coke. The receipts for the sale of tar also exhibit a falling off of £978. 5s. 7d. It is, however, satisfactory to note an increase of £5,189. 18s. 1d. in the receipts for ammoniacal liquor. The expenditure under the respective heads of retorts, materials and setting, and purifying charges is considerably less than in the previous year. In the item of uncollected accounts a further reduction is noticeable, the amount for the year being £552. 1s. 1d., equal to a total collection of 99·83 per cent, as compared with £810. 9s. 2d., representing a collection of 99·75 per cent, last year. Upon careful consideration of the whole of the circumstances, the Committee do not feel justified in making at present any recommendation to the Council as to a further reduction in the price of gas beyond that contained in the following resolution of the 21st day of July, 1882, viz.:—'That the Council be recommended to authorise this Committee to reduce the price of gas supplied beyond the city boundaries to consumers of 1½ million cubic feet per annum and upwards to the rate charged within the city, *i.e.* from 3s. 2d. to 2s. 6d. per 1,000 feet, such reduction to date from the 24th of June last.'" The analyst, Mr. John Leigh, reports that the average illuminating power of the Manchester gas during the past year has been equal to that of 19·77 London standard candles.

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Oct. 15. 82
Bonnie

RECEIVED
OCT 31 1882
ANSWERED

Oct 15. 82.

.....188...
FILE No.....

My dear Sir,

I sent a cable message to you the day before yesterday to say I was writing to you "Deprecating" written controversy - such as that which appears, to my great surprise & vexation, to have sprung up between the Board of the Edison Co. (London) & yourself. Into the matter of that controversy I will not enter except to say, that though the Secretary has carried on the correspondence in the name of the Board - the steps taken have been with their knowledge & sanction - & the correspondence has passed under my eye - & has been before the Board. The step of refusing your draft was a very difficult one for them to take, but as we were under the belief, & still are, that the draft was for

goods not ordered on our account, and there was no alternative

but to accept or reject it, at once. Now it seems to me,

that, as a pure matter of business, we were bound to have

or represent to decline payment. Indeed it would clearly

seem from what has since happened - that this was the only

proper method of protecting ourselves from what we deemed unauthorized

drafts, because if I read your letter of the 26th ult,

I understand you to contend, that by sending us something

different from what was ordered, which you say was

better, you were fulfilling an order virtually - which

had been given - & we having paid your draft after two

days delay, in a payment for this order so virtually given.

I cannot by you consider whether an exact fulfilment for

our order, (whether it were in your estimation for the best

pen of machine or not,) was not that, which as a matter

of pure business - we were entitled to expect. On us must rest

the responsibility of deciding rightly or wrongly, in the interest of the Company,

that is required, & have to pay for.

In respect to the other matter, as far as I can make out, you took a ~~[illegible]~~ stockholder's list, that we had "sufficient stock" in an order for "sufficient stock." But all these matters admit, I should hope, of friendly communication & adjustment: as I can safely say for my colleagues & the Board & myself, we have all along been animated by the desire not only to make a successful & prosperous adventure of the Company's concerns, but to contribute, as far as lay in our power, to extending & maintaining the first & pre-eminence of your system of electric lighting. There are much greater difficulties to contend with here in extending that system on a large scale & from a centre than have to be encountered elsewhere, & it is only by slow & persevering efforts that we can hope to overcome them. There will be much less likelihood of our being able to do so if you do not lend us your hearty cooperation, & in a cordial spirit. We are perceptibly making way within the last two months. Though we have been on the edge of one or two crises

disasters at our Holborn installation, which have only been avoided by the activity & skill of our professional assistants.

It must, I trust, be clear to every one - that, on the whole, we are best able, on the spot, & knowing what the difficulties are, & having the best scientific & legal advice in the country, to determine as to the method of surmounting them.

In conclusion, I have only to add, that the Board attach so much importance to the maintenance of the most cordial relations with yourself, that they have decided to send Mr. White their Secretary over to New York in the course of a few days, to communicate with you personally.

They have no doubt that by frank explanations - & mutual concession on matters in dispute between us - a satisfactory issue out of all such matters will readily be found.

Yours, My dear Sir,
Very sincerely

T. Edison Esq

E. Bouverie

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,
74, Coleman Street,
London, E.C., 17th Dec 1882

Thomas A. Edison Esq.
New York

Dear Sir,

After conferring with Mr. Fabbri on the subject, the Directors of the Company have instructed me to proceed to New York with the view of explaining to you, as far as possible, the reasons which have led them to take the steps which have formed the subject of recent correspondence.

I shall at the same time lay before you and Mr. Johnson a variety of information which will probably establish the position I have urged in private letters to Mr. Johnson – viz:– that the conditions prevailing in England for the establishment of the light are different to, + less favourable than, those existing either in the States or on the Continent.

My mission is intended in the first instance as a mark of respect to yourself, + I hope to succeed in shewing you that however wrong in other respects the administration of the Company may have been, there has never

evoked any other feeling towards yourself I may ~~no~~ add, Mr. Johnson, that that of friendliness either on the part of Board as a whole or of

Yours faithfully

Amola White

Mrs. White

Oct 17. 82

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John K. Porter.
Grosvenor P. Lowrey.
Geo Wales Soren.
Chas Francis Stone.
Geo. S. Hamlin.
Wm. L. Porter.

P. O. Box 1836.

Porter, Lowrey, Soren & Stone,
Attorneys & Counsellors at Law,
No. 3 Broad St. (Drexel Building)
New York, Oct. 19th 1882

My dear Johnson

I understand Arnold White is to be here soon — Mr Wright and I agree that the stronger your case in the differences with him the milder & more considerate & courteous must be the tone of him & us all —

Don't let us give him the slightest ground to complain that he has been met with any prejudice, impatience, unfairness, or want of business conduct & calm — Please tell Edison

what I say —

You have such unusual powers of clear & effective controversy that there is always a temptation to use them — as the possession of fine arms & skill in their use is a prolific cause of manslaughter — Don't set down on the White too hard! — & remember the Italian maxim to "make a bridge of gold for a retreating enemy"

Yrs
E P R

Oct 1952
Letter to
Lord Bryce

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 31ST OCTOBER, 1882.

T. A. EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

I BEG TO CONFIRM MY CABLEGRAM OF THIS DATE AS FOLLOWS:-

"HAS ONE "O" LEFT."

WE ARE NOW WAITING FOR ADVICE OF THE SHIPMENT OF THE 0 DYNAMO, AND AS IT WILL TAKE SOME WEEKS AFTER ITS ARRIVAL ERE IT CAN BE PUT IN PLACE WE SHOULD BE GLAD TO RECEIVE IT AS EARLY AS POSSIBLE IN ORDER TO COPE WITH THE DEMAND FOR LIGHTING FROM OUR CENTRAL STATION.

WE WROTE YOU TWICE FOR A "TEMPLATE" THAT IS A PAPER IMPRESSION OF THE BEDPLATE OF THIS DYNAMO, BUT HAVE NOT YET RECEIVED THIS. IT WOULD HAVE ENABLED US TO HAVE HAD THE FOUNDATIONS IN A MORE ADVANCED STAGE.

WILL YOU BE GOOD ENOUGH TO SHIP US AS EARLY AS POSSIBLE THE BALANCE OF OUR EXISTING ORDER FOR LAMPS? IN SEVERAL OF THE CASES WHICH WE RECEIVED LATELY THE BREAKAGES AVERAGED 2 1/2 TO 3 PER CENT.

I AM, DEAR SIR,

YOURS TRULY,

A. Bat Flint

for SECRETARY.

Please refer to E. L.

ADDRESS FOR TELEGRAMS: MATHER, MANCHESTER.

MATHER & PLATT, ENGINEERS

SALFORD IRONWORKS,

MANCHESTER, Nov. 7th 1882.

TELEPHONE No. 156.

Thos. Edison Esq.
65 Fifth Avenue N.Y.

Dear Sir,

We are much obliged for your cable quoting prices for armatures. We shall send you orders for some in a very short time.

We should not trouble you on this score if the business were in a more flourishing condition, — making us rather loth to organise for making these armatures until the demand is more lively.

However we intend becoming able to manufacture & are setting apart floor space for the different departments, and have cabled for Bushman to superintend the testing room.

The 14th bulletin has just come to hand and we congratulate you upon the healthy outlook of business in the States.

Mr. Wm Mather and the writer were in Paris a few weeks since, looking over

the magnificent factory Mr. Batchelor has there; & which we hope will soon be full of work.

We trust you will not forget to let us have full particulars of any changes or improvements you may make in the machine, as apart from the making, we are extremely anxious for the success of the system, and are helping the Company to the best of our ability.

With kind regards, We remain
Yours Faithfully
Marker & Platt
Harry Olrich

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 7TH NOVEMBER, 188 2

File

T. A. EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

I BEG TO CONFIRM CABLEGRAM OF THIS DATE AS FOLLOWS:-

TO YOU.

"HOW MANY AMPERES EACH WILL ARMATURES Z L K SAFELY CARRY REPLY."

WE ARE ABOUT TO LIGHT UP THE CITY AND GUILDS TECHNICAL COLLEGE HERE, AND THE INFORMATION ASKED FOR IS DESIRED AS A GUARANTEE BY THE PROFESSOR TO WHOSE SATISFACTION THE WORK HAS TO BE CARRIED OUT.

I AM, DEAR SIR,

YOURS TRULY,

A. Bachelder

SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., _____ 188__

Telephone No. 346.

ALL LETTERS TO BE ADDRESSED TO THE SECRETARY.

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Telegraph clipping

"Daily Telegraph"

7th November 1882

ELECTRIC LIGHTING.—A COMPLETE INSTALLATION, including an Otto Gas Engine and Siemens' Dynamo, with Swan's incandescent lamps, providing 10 lights of 20-candle power each, or 20 of 10 candles, suitable for a suite of rooms, library, picture gallery, club, billiards, or an exhibition, setting in motion, after sunset, 20 miles of London, for £110, by J. C. CLADDIS and CO., Electrical Engineers and Contractors, 154, Westminster Bridge-road, S.E. N.B.—Maintenance, 1d. per hour for gas and 4d. for engine, and be used for other purposes during the day. An installation as above, giving 20 full-power lights, £275; 20 ditto, ample for lighting a residence of moderate size, £350; 12 with a steam engine, £300 and £360 respectively. Estimates for larger installations upon reliable and economical systems, including arc lighting, storage, and transmission by power, [illegible]

[ON BACK OF PRECEDING PAGE]

Ask Mr. Edison
for Pamphlet —

Instructions

to —

Linesmen &c

THOMAS A. EDISON,
No. 65 FIFTH AVENUE,

NEW YORK, 188

Two E Dynamos of which we lately disposed were found to have had their Armatures bent, presumably by bad packing. They were returned to us and we have had to get them straightened at our expense.

In the packing of E Dynamo No. 30 the following articles were discovered to be short upon this machine being sent out a few days ago, Namely:– Switchboard, Brush holders, and Spindle.

We have had to replace these by articles taken from another dynamo and shall be glad to receive the articles named in a special case, to complete the machine.

Extract from letter of London Co dated 11th Nov 82

Bro #452 per S.S. Gallia of Lorne Aug 10

Issued 1 Bro approximately #452 was lost. Hence on account of normal consumption of a bro. Recp

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Lance Co. Nov —
Richmond Wks

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 11TH NOVEMBER, 1882.

Answered

T.A.EDISON ESQ.,
65, FIFTH AVENUE,
NEW YORK.

DEAR SIR,

I BEG TO CONFIRM CABLEGRAMS AS FOLLOWS:-

"TO YOU 9TH INSTANT.

"REPLY CABLEGRAM SEVENTH."

FROM YOU 9TH INSTANT.

"K 220 AMPERES L 132 Z 52."

TWO E DYNAMOS OF WHICH WE LATELY DISPOSED WERE FOUND TO HAVE HAD THEIR ARMATURES BENT, PRESUMABLY BY BAD PACKING. THEY WERE RETURNED TO US AND WE HAVE HAD TO GET THEM STRAIGHTENED AT OUR EXPENSE.

IN THE LAST CASE OF LAMPS RECEIVED CONTAINING 700, 33 WERE BROKEN. WE WOULD BE GLAD THAT YOU SHOULD GIVE INSTRUCTIONS TO THE LAMP FACTORY TO EXERCISE GREATER CARE IN PACKING, AS THE REPEATED BREAKAGES WHICH HAVE OF LATE OCCURRED ADD CONSIDERABLY TO THE COST PRICE OF THE WHOLE LAMPS.

IN THE PACKING OF L DYNAMO NO.30 THE FOLLOWING ARTICLES WERE DISCOVERED TO BE SHORT UPON THIS MACHINE BEING SENT OUT A FEW DAYS

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., ... 188.....

AGO, NAMELY:- SWITCHBOARD, BRUSH HOLDERS, AND SPINDLE. WE HAVE HAD TO REPLACE THESE BY ARTICLES TAKEN FROM ANOTHER DYNAMO, AND SHALL BE GLAD TO RECEIVE THE ARTICLES NAMED IN A SPECIAL CASE, TO COMPLETE THE MACHINE.

I AM, DEAR SIR,

YOURS TRULY,

W. Glerich

SECRETARY.

Mr. Insull,

Your memo. with Mr. Olrick's report and his report I am glad to get. I will read the same so as to hand them back to you on Friday.

S. B. Eaton

November 29th. 1882.

per Mc.G.

Nov 29 1882

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[ATTACHMENT]

(Nov. 15/82)

S. B. Eaton

Please read & return this

I think it might interest you —

Thanks

to see Edison

28/11/82

Mod.

LEWIS OLRICK, M.E. CONSULTING ENGINEER

27, Leadenhall Street,
London, E.C. Nov. 15th 1882.

Saml. Insull Esq.

My dear Sir

Enclosed please find a copy of a hurried report I made on my return to Hinglaind (vide I.A.E.)

I am not proud of it so you need not shew it to anyone but Mr. Edison.

Yours faithfully
Harry Olrick

[ATTACHMENT]

[FROM HARRY OLRICK?]

27 Leadenhall St.
London, E.C.
Aug 28th 1882.

William Mather, Esq.
Salford Iron Works, Manchester.

Dear Sir,

In making a preliminary report to you, as requested, of my enquiry into the Edison System of Electric Lighting it will be well, perhaps, to acquaint you first with my impression of Mr. Edison, as so much depends upon him for the success of incandescent electric lighting.

Mr. Edison I was agreeably surprised to find him to be a man of great simplicity, and whose earnestness and honesty could not be questioned by anybody after conversing with him for any length of time. Instead of being ready at the slightest inducement to put on the market any invention, original or suggested, as many people imagine, he makes a rule of carefully finding out whether his invention is "at least 10% better than anything else of a similar nature, previously known, that has thrown away as useless many hundreds of ideas which, at first glance, were very promising, but did not come up to this standard.

He appears to be ready at all times to give an unbiased opinion, whether for or against himself. He has, therefore, inspired me with the utmost confidence in his judgement & integrity. I thoroughly believe that he would not make a false statement, or garble results relative

(1)

[ATTACHMENT]

to any experiment or enterprise with which he was connected.

He has an unlimited capacity for work, providing he is interested, but loses interest when the great difficulties are surmounted, & ordinary intelligence can finish what he has commenced; – to this may be attributed the reason that the Central Station in New York has not long since been completed & running, for after completing the experiments with the Dynamos the size and location of the copper mains and feeders, and carefully formulating the plans for the guidance of the Company, he left them to finish the business.

Edison Electric Light Co. — The Edison Electric Light Co. owns all Edison's American patents, & they provided the necessary money to pay for the costly experiments necessary before the system was completed.

Edison Illuminating Co. — This Company licensed the Edison Illuminating Co. to put down plants for general distribution of light & power from Central stations, the first plant being now almost completed and another in contemplation.

Edison Isolated Company — The Edison Company for Isolated Lighting has been licensed by the Edison Electric Co. for supplying plants outside the Gas Companies' limits, to mills & manufactories, but, under special permission they also supply to people who do not care to wait for the general distribution, which will necessarily be slow.

This Company has been eminently successful, and although they have not been organized more than 11 months, I was informed that they have earned 15% on their capital invested.

[ATTACHMENT]

Their work has been chiefly amongst Mills & Hotels. In all cases they have sold the plant outright, not having sufficient capital to install on the basis of rental. They do not advertise for business at all, but employ travellers on salary & commission

Central Station

The first central station which is now nearly half finished is situated in the Southern part of New York, which is devoted to Offices and Warehouses, & is in consequence, a very unfavorable site for Lighting purposes, the locality being almost entirely deserted after 7 pm. There is, however, a large amount of power required for driving elevators & small shops, & the Company hope eventually to supply these places with motors and cement.

The number of hours per annum when light is required does not exceed 300, whereas in the upper or residential part of the City the light would be required for about 1000 hours per annum, & it is in this district that the Illuminating Co. intend putting down the second plant.

The station consists of 2 buildings, ordinary warehouses, about 25 feet frontage each & about 75 feet deep, having 3 floors.

There are to be 6 – 1200 light dynamos in each house, but only one ~~house~~ house has been fitted at present, & that will not be running before about the commencement of next month.

In fitting this building they have, in my opinion made the mistake of putting the 6 Dynamos, with their directly connected Engines upon the first floor, or rather upon a structure built independently

[ATTACHMENT]

of the walls of the building, instead of on the ground floor where the boilers have been placed.

This arrangement may give rise to serious difficulty from vibration, besides the heat from the boilers will increase the trouble of keeping the armatures cool.

The 2nd floor is devoted, at present, to the apparatus for regulating the current and a high & low EMF Indicator.

The 3rd floor is to be used as a testing room. When the two houses are completed they will be capable of supplying current to about 14400 - 16 candle power lamps, or the equivalent of a constant supply of 77000 cubic feet of gas, estimating 3000 candle power for 1000 ft. of gas.

The current will be supplied through a system of mains & feeders, that is, the mains are laid throughout the streets, & are supplied with electricity by the feeders which go from the dynamos to different parts of the system, the houses being connected to the mains only.

The system of laying these mains is shown on looking at the map which I sent you.

It is necessarily very important that no leakage of current should take place, and therefore great care is taken that the conductors are perfectly insulated one from the other, & from earth. This is effected by putting the 2 conductors (½ round in section) into steampipes holding them in position by thin pasteboard, & then running in a special insulating material made of asphaltum, resin, & linseed oil; this compound which is the result of many experiments is so perfect, that

each tube of some 18' 0" long shows a resistance of 300,000,000. ohms between either conductor & the pipe.

This station has cost up to the present time about £60000, but it has necessarily been more expensive than plants of similar size will cost in future.

The officials of the Company seem very confident of making a financial success of the undertaking.

Mr. Edison has gone very carefully into the estimated cost of production, ~~[illegible]~~ of the light & states that, including depreciation, interest, coal, wages, & maintenance, the cost will be 4/6 for every 3000 candle power, this being the estimated light given by the combustion of 1000 cubic feet of gas of good quality.

This price of 4/6 is based on using the light only 300 hours per annum, but as you are aware the cost of the light decreases at a very rapid ratio as the time of using increases, and therefore Mr. Edison estimates the cost for the residential portion of the City @ 3/4 per 3000 candle power.

These figures cannot be looked upon as a basis of calculation for England, since the coal costs 18/- per 2000 lbs., & labour & materials are very high.

The Engines used by Mr. Edison up to the present time have been the Porter-Allen high speed engine similar in all respects to those in use at the Holborn installation. These engines have, however, given some trouble, & Mr. Edison is trying the Armington & Sims engine. The first named engine is supposed to give an IHP with 4 lbs. of coal, & 26 lbs. of water; the latter has not been tested yet.

Boilers. Vertical fire tube boilers are used for small isolated plants, & Babcock & Wilcox boilers for the larger installations.

Laying Mains. Laying mains in the street is a very simple operation, the only care required being in the soldering of conductors into the sockets, and of course connecting all negative poles with negative poles. The soldering is effected by the use of a hydrogen flame, this gas being made & contained in copper cylinders, easy of transportation. I papers drawings showing the different sections of tubes of different capacity.

Meters. Very careful experiments are still being made to perfect the meters, with every chance of success.

Transmission of power. The experiments which have been carried out to determine the loss in transmitting electrical energy have proved conclusively that not more than 40% is lost, & thus the use of electricity is shown to be as economical as the use of compressed air or hydraulic power. The 40% of loss could be materially reduced with an increase of copper conductors, but, in Mr Edison's opinion, the extra cost is not worth the increased economy.

I had every opportunity of seeing Mr Edison's Electric Railroad, which seemed to work perfectly in all respects. The current is carried 1/2 a mile from the Laboratory at Menlo Park to the grounds where the 3 miles of railroad are laid, the rails then becoming the conductors of the current. The motor itself consists of an ordinary dynamo machine with the field laid horizontally instead of vertically in fact similar to the 1200 light machine. By a very simple arrangement the current is turned either on one

side or the other from the commutator so as to reverse the motor when ~~what~~ desired. I had a practical proof that the current can be suddenly reversed without burning out the armature, as in running round a curve we came suddenly upon some freight cars on the track, & it was necessary to stop & reverse the motor quickly. Experiments are being made to determine the sizes of motors for different purposes, for sewing machines, lathes, elevators, but when I left these experiments had not been finished.

Manufacture of electric tube. The manufacture of the electric tubes or conductors is carried on by the Electric Tube Co. of New York at very considerable profit to themselves. This manufacture is of an extremely simple nature, requiring only open boilers, air pumps & force pumps, besides the ordinary testing apparatus in the shape of a Wheatstone Bridge of high resistance, & Thompson Galvanometer.

Lamps. The lamps are made at a very large factory in Newark, which will shortly have a capacity of 100,000 lamps per day, but as you informed me that they would always make these lamps, I did not spend the time to go over this factory.

Dynamos. The dynamos machines are made by the Edison Machine Works, Mr. Edison being the owner, working under a license from the Edison Electric Light Co. There has been, according to Mr. Edison's private Secretary, some 300,000 dollars put into these works, & up to the present time no profit of any description has been made by the manufacture & sale of the machines, Mr. Edison preferring to turn out a cheap & efficient machine without profit to himself, believing that his outside interest would be benefited to a greater extent than

[ATTACHMENT]

a commercial profit on the machines would give him. You will, therefore, perceive that in making these machines your only chance of profit will be the difference in the cost of materials and labour. I would say here that although the machine appears to be of very simple construction, the great care necessary in making the insulation has been a fruitful cause of considerable loss, even to the Edison Machine Works where a number of men are employed as foremen who have been working for many years for Mr. Edison.

Improvements. I am not aware what official connection Mr. Edison has with the Edison Electric Light Co., but I know that he is working very hard at the present time to improve the lamps, the automatic regulation of the current, and, in general, to increase the efficiency. His aim is to obtain a lamp, having a much higher resistance than those previously made. At present a 16 candle lamp has a resistance of 140 Ohms, & Mr. Edison hopes to produce one with a resistance of 500 Ohms. He has already succeeded in making one of 280 Ohms resistance, which has stood the test of work remarkably well. He is therefore encouraged to proceed with these experiments.

His success in this direction would mean a very great reduction in the cost of conductors, from the fact that the Electro Motive Force & Candle power are not in direct proportion; that is to say the present 140 Ohms lamp absorbs ·75 Webers of current, whereas the 280 Ohms lamp absorbs about ·45 Webers of current.

Mr. Edison's Suggestions. Mr. Edison impressed upon me to tell you that, in his opinion, general distribution was the secret

[ATTACHMENT]

of success in Electric Lighting, he strongly advises that you turn your attention to this in preference to attempting the introduction of isolated plants, pointing out that the current from a central station where economical engines can be used & where labour & supervision is concentrated, can be obtained at much cheaper rates than by small isolated plants.

He strongly advises the sale of candle power or light, & not the sale of current, since improvements in lamps, &c., would then become a profit to the Co., in preference to the consumer. I pointed out to him that gas is very much cheaper in England than in America, but still he is firmly impressed with the belief that the cheaper coal & labour here would allow the light to be supplied at the same rate as an equal candle power in gas.

Trusting that the above short sketch is sufficient for your present requirements, reserving details for my further, more exhaustive, report.

I remain, Dear Sir,

Yours faithfully

Telephone No. 346.

ALL LETTERS
TO BE ADDRESSED TO
THE SECRETARY.

The Edison Electric Light Company, Limited,

74, Coleman Street,

London, E.C., 19 Dec 1882

My dear Insull

I was home too late last night to send by good boy so send a line of the fund.

Please don't forward the radial bar. Also a letter signed J.P.S. giving us the Inventor Company permission to buy well to & from each other.

I was sorry to hear of your continued pain & consequent departure from Boston. Take care of yourself.

With kind regards
Yours truly

(Mc Laughlin)

The chief chatter like h —

There is a man hard for Burgmann at 165 w. 9th mind seeing that he has it.

TELEPHONE No. 532.

All Letters to be addressed to the Secretary.

Inserted above to be forwarded to the Edison Lamp Factory

The Manchester and District

Edison Electric Light Company Limited.

19, Victoria Buildings,

(Goods to 7, St. Mary's Gate,)

Manchester, Dec 19th 1882

The Edison Electric Light Co
65 Fifth Avenue
New York.

Gentn

Will you kindly forward at your earliest convenience 2,000 Edison A lamps, of 106 volts resistance, to the above address. I should be glad if, immediately on receipt of this, you would kindly write me a line to say when I may expect them. Meanwhile, believe me

Yours very truly
Jos Freemantle
Secy

32

Dec 19.82

Manchester Co

P A R E N T C O M P A N Y.

Cut down your expenses as far as possible. Dispense with the services of all Electricians, or if contracted with on salary do not use them. Engage a good mechanical engineer who has had practical experience and a fair education, one having some executive ability, not older than Olrick. Send him to America, to learn the business practically and scientifically, he to be recalled only when needed.

Permit me to teach a man here to be sent hereafter to England, capable thereafter to determine the net work conductors of the general system, as well as small installations. Salary say twenty pounds sterling per month. These two men with what assistants they can obtain can superintend any installation in England 1 or 10 miles square.

Arrange with manufacturers in England or America or both to manufacture for your licensees everything needed, so that should you sell a certain area and your licensee desires to establish a half mile or whole mile area your engineers can work out the whole thing, and from his data the manufacturer you have arranged with can bid for the whole work if desirable.

~~Pay nothing against your exportations but explain the reason why your prices are at the moment higher.~~ If you

Bergmann & Co. will bid against anyone to deliver the whole of the regulating apparatus and devices at the Central Station, and every kind of supplies for wiring.

The Electric Tube Co. will bid for the underground tubes for a square mile with all the services, and lay the same and deliver the whole over in working order, (except digging and paving).

The Goerck St. Works will bid for steam dynamos, set them in position and guarantee them.

The Lamp Co. will furnish of course the lamps, or the Tube Co. will learn an agent of any manufacturer you desire to make your tubes, ~~they~~ and so will Goerck St. if it is so desired.

My impression is strong that but one Company should be formed for the whole of London, but I suppose that is now impossible,—let them take over the Holborn installation and arrange to light one half square mile in London. Their capital should be small at first, with power to increase as they expand after our plan here. The first outlay will be the real estate, then the plant can be gradually increased, until the whole of the square mile is lighted. Your investment will be gradual and

only made if warranted, but you must prepare your plans just as if you were going to make the whole installation, otherwise, it will be a sink hole for money. The small stations you are now installing will have a hopeless future.

The Parent Company must do no business, it must act as the agent of its licensees, doing all by the engineer department, and arrangements with manufacturers for its licenses, that is necessary to make a complete installation, and men for continuing its running. Any attempt to permit the licensees to do what they please will result in bankruptcy of the licensee, and no future profit to the Parent Company. I do not believe in the policy of taking a large initial sum in money, make it small, take more shares.

You have $50.000 invested in large dynamos at Goerck Street, we will try and get rid of some of them.

You have a lot of isolated machinery, we will try and get rid of some of this, but I think you better not accept this offer, if it is at all possible to form an Isolated Company.

You sell lamps to any one who wants them. I do not believe in this, the policy is bad, it is a small fry business, and will hurt the reputation you will acquire in the future, ~~if~~

if the Isolated policy is adopted, people judge by the lamps if the engine is unsteady or the dynamo bad; the criticism all falls on the lamps.

You have licensed the British Company to use their lamps, I do not believe in this, in five or six years, without you get it back in the meantime, you will be immensely hampered.

I believe in having nothing to do directly or indirectly (whereever such a thing is possible) with any Electric Light Co. in England. To make no trades allianesa of any kind or character,. To sustain the patents whenever you have time, to do this leisurely and with great previous preparations.

That if you fail to stop an infringer, never mind, when the proper time comes try him on another point. If we are proved infringers on any point, I can probably take care of that, myself. We are getting out new patents. These patents, are wel drawn, they will probably stand the test, <u>it is future patents</u> that will secure the system that replaces gas with great profit. The patents I am now taking out are more valuable than those already taken. Those already taken were to secure if possible the science of the thing. Those I am now taking are commercial.

Never stop an infringer, who is daily losing money by so infringing, give him plenty of rope.

Appoint and pay some one here connected with our Company to keep you posted daily in every advance, scientifically and commercially; to give you all the experience, data as they come up; to gather information for you.

Conduct the business of selling light exactly as the business of gas lighting is carried on, their system is admirable. Sell light or power only. Sell it on a meter, never sell electricity, keep the pressure always on the mains.

It has been stated that my estimate, already made shows that we cannot compete with gas, very well I will make a new estimate. The cheapening process has been going on since that estimate was made, before you get Legislative permission to open the streets, it will be cheaper still, this process of cheapening will continue to go on until there will not be a place where gas is so cheap that the electric light cannot compete with it at a profit, if it gets one half the comsumption.

If owing to peculiar conditions you want something different or something changed, give me minutely every detail, the

why and wherefore, and I will probably be able to give you what you want. I have nursed the baby so far and I believe I can continue to do so without any extraneous aid, especially from those who said the baby would never be born and when born would never live, and now that it lives wants to change the manner of nursing. XXXXXXXXXX If I should fail in any particular, it will then be time to call in other inventors.

why and wherefore, and I will probably be able to give you what you want. I have nursed the baby so far and I believe I can continue to do so without any extraneous aid, especially from those who said the baby would never be born and when born would never [illegible] and for that it lives wants to change the manner of nursing. XXXXXXXXXX If I should fail in any particular, it will then be time to call in other inventors.

Mrs. Lorenzo Dow Harvey
Chicago
Illinois

29

[FROM THE EDISON ELECTRIC LIGHT COMPANY, LTD.?]

(No. 1 d. Forwarded Message Form.) 100,000, 12, 3, '81.

The Direct United States Cable Company, (Limited.)

PRINCIPAL OFFICE, 52 OLD BROAD ST., LONDON, ENGLAND.

In connection with the Atlantic & Pacific and Franklin Telegraph Companies in the United States, and the Dominion Telegraph Company in Canada.

No. .....

No. of Words, ...188

Send the following CABLEGRAM, "VIA DIRECT CABLE," subject to the conditions printed on the back hereof, which are agreed to.

To .....

London Co Agreement now well known constitutes precedent to many which in principle occasions great delay & new difficulties! Have already seriously fed Australian negotiations necessitating abandonment principle sale outright. Please authority Agreement each Co including Australian, on London basis mutatis mutandis leaving

Please read the conditions at back and sign your name and address thereon for reference.

(No. 1 d. Forwarded Message Form.) 100,000, 12, 3, '81.

The Direct United States Cable Company, (Limited.)

PRINCIPAL OFFICE, 52 OLD BROAD ST., LONDON, ENGLAND.

In connection with the Atlantic & Pacific and Franklin Telegraph Companies in the United States, and the Dominion Telegraph Company in Canada.

No. .....

No. of Words, ...188

Send the following CABLEGRAM, "VIA DIRECT CABLE," subject to the conditions printed on the back hereof, which are agreed to.

To .....

nominal capital and value of shares each Co's directors. A shares to be at least four times amount of cash advanced in each case viz India 25000 Australia 25000 Newman & Co 5000. Reply soon. Other companies active in colonies.

Please read the conditions at back and sign your name and address thereon for reference.

Mr. Insull,

Will you kindly give me the following information?

First. Names of the Directors in the English Company with their proper titles if they have any.

Second. Names of the Officers! Electricians and Engineers.

Third. Nominal capital of the English company and under what laws organized.

Fourth. Headquatter office and where located?

Fifth. Extent of territory for which they own patents and also in what business they are engaged, that is to say whether lighting, manufacturing or simply holders of patents.

Seventh. The same details regarding any and all subordinate companies in existence in the same territory.

Eighth. Name of company in each case.

Will you please give me this information any time within the next week or ten days?

S. B. Eaton

per Mc.C.

BERGMANN & CO.

108-112 WOOSTER STREET.

(BY APPOINTMENT.)

MANUFACTURERS OF EDISON'S INVENTIONS,

EDISON'S ELECTRIC LIGHT APPLIANCES A SPECIALTY.

New York, ... 188

Capital 1,000,000.
Paid in 500,000.

Crystal Palace & Exhibition
Holborn all up to March 15 — 145,000.
Paid — 100,000.
Machinery — 200,000.
Left — 30,000.

Owe. 20,000.

Assets. C Dynamo. 40,000
L & K & Z machines, 815,000
Manchester owes in two years — 80,000.

Running Expenses Including Dividend
Holborn Directors etc, 50,000.
get back from them 75,000
Out — 425,000

Eight — 2 New Installations

3

Memo by Edison
on
Finances Lma Co.

1

~~Put company on as good a footing as possible.~~

Organize an Isolated Company with good Mechanical Engineer such as Olrick at head of it, Let this new Co operate over Whole England with restrictions as in U.States. Turn over to Co all isolated machinery & supplies, Conduct business as in US, no advertising. Make the best installations possible & see that whatever you do make continue to give satisfaction, adopt a mobile policy. ~~Get services two or more good~~ Commercial travellers preferably those who have been employed in Machinery houses, instruct these men minutely how to present the subject arguments to use & methods of figuring. Engage them on Salary at first. Keep ~~separate~~ accounts of parent Co & Isolated seperate, ~~[illegible]~~ to make money ~~[illegible]~~ after receiving

~~and orders [illegible] - pay great attention to your supply department do not get out of supply of small supplies, [illegible] order ahead as the business warrants~~

Say nothing against your competitors but explain the reasons why our prices are ~~higher, but~~ at the moment higher, if you lose the order, very well, try another, ~~sell~~ do all business by personal solicitation wherever possible, whatever ~~you have~~ orders you do get execute quickly and well.

Dont be in a hurry to make money ~~except~~ ~~to make money at the end of two years~~ dont interfere with the head of your specialist dept. in detail ~~start of business~~ - dont hamper him too much with the ~~[illegible]~~ ~~[illegible]~~ red tape of a board of directors, wh~~[illegible]~~ ~~Leave [illegible]~~ ~~[illegible]~~ Now let the Isolated to take care of itself.

29

Wm. Edison
Memo as to
Coins to be
printed by
Lond Co

Board of Trade Provisional Orders — Dr Hopkinsons Report thereon.

I have carefully read the Requirements of the Board of Trade & Dr Hopkinsons Report relating thereto, and am forced to the conclusion, after perusal of the latter, that Dr Hopkinson fails entirely to appreciate the nature of the business upon which your Company is about to enter. It must be remembered that your competition will not lie with rural Electric Light Companies it will be with the Local Gas Companies, & you propose to enter the lists against them in the business of public illumination. You will have to cater for the public and in order to get their custom you must be prepared to do it ~~on a basis in such a manner as to enable the good Customers to~~ a manner as near as

possible like that at present adopted by the Gas Companies. You must charge your customers for exactly what he uses, the basis of that charge must be elastic enough to allow only of his paying only for the time he uses it. Furthermore your charges must be uniform whether a man uses one or a hundred lights. You must be prepared to supply light at all times whenever your customers choose to take advantage of your system and in order to do this you must never take the pressure off your mains for an instant.

I consider Dr Hopkinson's proposed basis of charge entirely erroneous. I fail entirely to see the necessity of making two different classes of charges. ~~what your Customers require is light I think~~ The proper course to adopt is to estimate what

your current will cost you add to that the maximum amount of profit you pe-require and then undertake to supply a given number of units of light (~~candles~~ standard candles) for a and ~~&~~ (not a given number of units of electricity) for a given sum
with gas the charge is for a given number of the gas Companies takes units of gas (feet) as the basis of charge irrespective of the amount of light that gas gives. Phebuetacally of course a given amount of gas will give a certain amount of light but in practise it never does so owing partly to uneven pressure ~~often~~ sometimes in the mains sometimes in the house gas pipes, ~~[illegible]~~ always to the detonation in the gas burners. Now our basis of charge must in this respect differ from

that of the Gas Companies.
Dr Hopkinson is entirely
wrong in stating that units of
light electricity should be
the basis of charge. To
adopt this course would
greatly militate against
the future of advancement
of gas Companies. Units
of light (Candle power)
must be the basis of charge
& not units of electricity.
If in the future improvements
are made in the economy
of our lamps the public
would be the only ones
~~to ha~~ who would have
the advantage of it if Dr
Hopkinsons proposal were
carried out, whereas if
units of light are taken
as the basis of charge
you will reap the advantage
of increased economy.
As to Dr Hopkinsons
proposal "that each consumer
should be required to declare
beforehand the maximum
current he would wish to

dead, & that the current should be cut off immediately that amount is exceeded" of course has no power if you refuse to admit the soundness of his views as to proposed basis of charge.

I think it should be provided that we should be allowed to use any pressure by our mains up to 200 volts we undertaking never to have a variation of more than seven volts. The limits of our pressure should not be from 103 to 110 volts as at some future time we may find it to our advantage to work our system at a higher ~~or a lower pressure~~ I think however the limit of 200 volts will answer all practical purposes.

There is not the slightest necessity to demand a certain specified time during which pressure can be taken

off our mains for the purpose of electrical testing. My Central Station here has now been running continuously since September 2nd without stopping for one instant and all electrical tests are made that are required while running & this is the way your local Illuminating Companies must run as they must at all times be ready to supply light with not even an intermission of ~~two minutes~~ an instant per day.

I do not think you should require more than an ordinary notice from a would-be consumer that he requires your light ~~prior~~ now should you require ~~of~~ him an undertaking that he will use the electricity for a certain time ~~all~~ ~~who~~

What you have to do is select a district of say a mile square canvass it thoroughly so as to arrive

at the amount of gas used within that distance & then you can estimate the maximum amount of light you could under the best circumstances get customers. Then choose your central station determine ~~figure~~ on the size ~~size~~ of your mains & feeders & when you have installed your plant supply those with light who are prepared to pay the expense ~~of been~~ (cost of house wiring & connecting with mains) of being cut in, supply light on a meter taking units of light as the one and only one basis of charge & when your customer is dissatisfied take the light out - In short perform the functions of a gas company - the only difference being that your basis of charge is units of light (candle power) while that of the

Gas Company is units of Gas (feet). This is the only practical & satisfactory way to do the business — to pursue any other course will involve you in hopeless trouble with the Public & be an Endless Fault. Remarks that the prime cost of our machinery is probably higher than that of our competitors are erroneous. He surely must have forgotten all that Mr Johnson told him as to my system being especially devised for Central Station lighting. You have no competitors in this dept of your business. Your investment in copper will be but half of that of any rival E. L. Co. Your investment in Coolers & Dynamos will be far less than that of any others when you consider the economical results

to be obtained from them. If you have a competition why have not other Companies made such an installation as you have on Holbourn Viaduct which is Central Station lighting on but a very small scale & imperfect scale. The only competition you have to fear is the Gas Company. Leave all other Electric light Co out of this question. In reading Dr Hopkinsons report I am forced to the conclusion that your Company has no one in its service who understand the first rudiments of Central Station lighting and if you wish to make a success of this Dept you cannot too early select an engineer of energy & ability & with no prejudices & send him over here (not necessarily for delivery) to get a thorough knowledge of that Department of Electric Lighting to which my System

particularly applies
viz Central Station Lighting

[illegible]

Decision in Rules
of Board of Trade &
in Hopkinsons Patent
Cases

IN PARLIAMENT

SESSION 1882.

HOUSE OF COMMONS.

ELECTRIC LIGHTING BILL

TO THE HONOURABLE THE COMMONS OF THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND IN PARLIAMENT ASSEMBLED.

THE HUMBLE PETITION OF THE EDISON ELECTRIC LIGHT COMPANY LIMITED, THE ANGLO AMERICAN BRUSH ELECTRIC LIGHT COMPANY LIMITED, SIEMENS BROTHERS & CO. LIMITED, THE BRITISH ELECTRIC LIGHT COMPANY LIMITED AND OF THE ELECTRIC LIGHT AND POWER GENERATOR COMPANY LIMITED ETC. ETC.

SHEWETH:

1 THAT BY THE BILL TO FACILITATE AND REGULATE THE SUPPLY OF ELECTRICITY FOR LIGHTING AND OTHER PURPOSES IN GREAT BRITAIN AND IRELAND NOW PENDING IN YOUR HONORABLE HOUSE IT IS PROPOSED TO GIVE TO THE LOCAL AUTHORITY POWER TO PURCHASE FROM THE UNDERTAKERS THE WHOLE OF THEIR UNDERTAKING AT THE EXPIRA--TION OF FIFTEEN YEARS FROM THE DATE OF THE PASSING OF THE ACT CONFIRMING THE PROVISIONAL ORDER AT THE FAIR MARKET VALUE OF THE LANDS BUILDINGS WORKS MATERIALS AND PLANT AT THE TIME OF THE PURCHASE WITHOUT ANY COMPENSATION IN RESPECT OF COMPULSORY

PURCHASE OR GOODWILL OR OTHER SIMILAR CONSIDERATIONS

2 YOUR PETITIONERS SUBMIT THAT A TERM OF FIFTEEN YEARS IS INSUFFICIENT FOR THE PROPER DEVELOPEMENT ON A LARGE SCALE OF UNDERTAKINGS FOR THE SUPPLY OF ELECTRICITY FOR LIGHTING AND OTHER PURPOSES. THE EXPENSES OF FIRST ESTABLISHING SUCH UNDERTAKINGS, HAVING REGARD TO THE NOVEL CHARACTER OF THE WORK, MUST NECESSARILY BE LARGE AND THE PECUNIARY RISK INVOLVED MUST BE CONSIDERABLE AND IF THE UNDERTAKERS ARE LIABLE TO HAVE THE ENTIRE UNDERTAKING PURCHASED COMPULSORILY ON SUCH TERMS AT THE END OF FIFTEEN YEARS SUBSTANTIAL COMPANIES WILL BE DETERRED FROM UNDERTAKING ANY BUT SMALL AND ISOLATED INSTALLATIONS OR IF LARGER INSTALLATIONS ARE UNDERTAKEN IT WILL BE NECESSARY TO CHARGE MORE ONEROUS TERMS THAN WOULD BE THE CASE IF A LONGER PERIOD WAS CONCEDED AS WELL AS MORE FAVOURABLE TERMS OF PUR--CHASE THAN THOSE CONTAINED IN THE SAID BILL, AND THE NATURAL DEVELOPMENT OF THE SYSTEM OF ELECTRIC LIGHTING WILL THUS BE HINDERED.

3 YOUR PETITIONERS SUBMIT THAT THE POWER OF COMPULSORY PURCHASE OF THE UNDERTAKING BY THE LOCAL AUTHORITY SHOULD NOT ARISE UNTIL THE EXPIRATION OF TWENTY ONE YEARS FROM THE DATE OF THE PASSING OF THE ACT CONFIRMING THE PROVISIONAL ORDER AND THEY HUMBLY PRAY YOUR HONORABLE HOUSE TO AMEND THE BILL IN THIS RESPECT BEFORE IT IS PASSED INTO LAW

A N D YOUR PETITIONERS WILL EVER PRAY &C

Extract
from Report of the Streets Committee of The Commissioners of Sewers of the City of London on the Results of the Electric Lighting of Public Ways within the City of London in 1881-82 —

The Holborn Viaduct is at the present time lighted experimentally by the Edison company who have placed two incandescent lamps in each gas lantern, each lamp, as stated by the company, giving about the same light and the two therefore double the light of the Gas Lamp as an ordinary gas lamp, desired. No lamp is more than 66 feet distant from another. There is scarcely any part of the Viaduct which is better lighted than another; there are no strong shadows to deceive the eye and the footstep; there is no flickering and no material variation in illuminating power so far as can be noticed by the ordinary observer, and the Viaduct is, for all practical purposes, well lighted —

This Edison experiment will, when terminated, be specially reported on; and is only referred to here, to assist in the consideration of the advantages derivable from the great volume of light given by the Arc light compared with that given by the ordinary gas lighting, the Incandescent lamps on the Viaduct being arranged on the same principle as the gas lighting, and aiming at uniform distribution of light over the public ways —

(No. 26)

THE EDISON ELECTRIC LIGHT COMPANY, LIMITED.

ESTIMATE GIVEN FOR 80 SWAN LAMPS.

A. SWAN 20 CANDLE POWER.

				17. 140
1	B. BURGON MACHINES	90		
1	TWO-WAY SWITCH		15	
80	SWAN LAMPS	20		8
40	SOCKETS	2		
200	YARDS MAIN CABLE	10		10
200	YARDS BRANCH WIRE	4		4
	LEADS, CUT-OUTS AND COUPLINGS	2		2
4	SIX LIGHT ELECTROLIER	28		
2	ONE LIGHT BRACKET	1	17	
	PACKING & DELIVERY ON RAIL	5		
	£	163	12	

WITHOUT DYNAMO £73. 12. 0.

TOTAL ~~ESTIMATE~~ estimate FOR 120 LAMPS £285. WITH ALL MACHINES, UNLESS SPECIALLY ORDERED 7 IN: PUL--LIES ARE PROVIDED.

163 5
815

(Copy)

List of Birgin Machines Manufactured by R. E. Brompton & Co.

Arc Lighting						Incandescent Lighting							
Mark of Machine	No. of large Arc Brompton Lamps burned in circuits	Candle power (nominal) of each Lamp	No. of small Arc Lamps (Weston) burned in circuits	Candle power (nominal) each small Arc Lamp	Total Horse power required	No. of Swan Lamps 20 Candles each 32 Ohms Hot	No. of Maxim Lamps 30 Candles each	How arranged	Approximate Horse-power required	Price £	s.	d.	Remarks.
A.	1	4,000			2 1/2	25	18	1 parallel	4				
B.	3	3,000	5	500	4 1/2	48	33	3 parallels	6	80	"	"	
B.1	2	5,000			5	40	28	2 parallels	5 3/4	80	"	"	
B.2	1	6,000			3 3/4	30	22	1 parallel	4 3/4	80	"	"	
C.	4	3,000	7	500	5 3/4	80	55	5 parallels	9 3/4	100	"	"	Generally used for Arc lighting
C.1	3	5,000			6	72	48	3 parallels	9	100	"	"	
C.2	2	6,000			6	56	38	2 parallels	8	100	"	"	Most generally used for Incandescent Lighting
C.	1	12,000*			6 1/2	40	28	1 parallel	7 3/4	100	"	"	* Search lights for Naval and Military purposes
D.	6	3,000	12	500	8 1/2	120	84	6 parallels	14	150	"	"	

Unless specially mentioned the Machines all run at 1600 to give the results above.
7 inch pulleys are supplied with all Machines unless specially ordered.

(Copy)

Cost of 80 - 8 Candle Installation

1, Z Dynamo		140	.	.
1, 30 Light Switch		1	2	6
80, "B"	@ 2/6	10	.	.
80, Sockets without Cocks	@ 2/2	8	13	4
600, ft of # 10 wire or 37 lbs	@ 1/8	3	1	8
8, lbs of # 18	@ 1/8		13	4
5, lb of Staples	@ 5d		2	1
25, Cut outs with plugs	@ 1/8	2	1	8
1, Roll of Tape			2	.
4, 6 Light Electroliers # 23 @ 179/2		35	16	8
2, 1 " Brackets	@ 7/6		15	.
Delivery on Rails & packing		3	.	.
	£	205	8	3.

1 Z dynamo	580
no switch	
80 B lamps 48 of 8 & 40 of 16 candle ~~[illegible]~~	44
80 Sockets, without cox - twist lamp. 20c	16
600 feet No 10	16
No 18	4
Cut outs	10
Tape	1 50
Electroliers	175
bracket	4
plug	15
	$864.50

$1200
15.00

864
35
829

864.50

(Copy)

Cost of 80-16 Candle Lamp Installation

2, Z. Dynamos	@£140	280	.	
2, 80 Light Switches	@£1.13.9	3	7	6
80, "A" Lamps	@ 2/6	10	.	.
80 Sockets without Cocks	@ 2/2	8	13	4
600, 2# 10 Cable	@ 3d	7	10	.
8 lb, # 18 wire	@ 1/8		13	4
10, lb Staples	@ 5d		4	2
50, Cut outs with plugs	@ 1/8	4	3	4
1, Roll Tape.			2	.
4, 6 Light Electroliers # 23	@ 179/2	35	16	8
2, 1 Light Brackets	@ 7/6		15	.
Packing and delivery on Rails		5	.	.
	£	356	5	4

A Note on the Sources

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END

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